INNOVATION THROUGH ACTION RESEARCH IN ENVIRONMENTAL EDUCATION: FROM PROJECT TO PRAXIS

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Abstract

This thesis is a work-in-progress that articulates my research journey based on the development of a curriculum innovation in environmental education. This journey had two distinct, but intertwined phases: action research based fieldwork, conducted collaboratively, to create a whole school approach to environmental education curriculum planning; and a phase of analysis and reflection based on the emerging findings, as I sought to create personal "living educational theory" about change and innovation.

A key stimulus for the study was the perceived theory-practice gap in environmental education, which is often presented in the literature as a criticism of teachers for failing to achieve the values and action objectives of critical environmental education. Hence, many programs and projects are considered to be superficial and inconsequential in terms of their ability to seriously address environmental issues. The intention of this study was to work with teachers in a project that would be an exemplar of critical environmental education. This would be in the form of a whole school "learnscaping" curriculum in a primary school whereby the schoolgrounds would be utilised for interdisciplinary critical environment education. Parallel with the three cycles of action research in this project, my research objectives were to identify and comment upon the factors that influence the generation of successful educational innovation.

It was anticipated that the project would be a collaboration involving me, as researcher-facilitator, and many of the teachers in the school as active participants. As the project proceeded through its action cycles, however, it became obvious that the goal of developing a critical environmental education curriculum, and the use of highly participatory processes, were unrealistic. Institutional and organisational rigidities in education generally, teachers' day-to-day work demands, and the constant juggle of work, family and other responsibilities for all participants acted as significant constraints. Consequently, it became apparent that the learnscaping curriculum would not be the hoped-for exemplar. Progress was slow and, at times, the project was in danger of stalling permanently. While the curriculum had some elements of critical environmental education, these were minor and not well spread throughout the school. Overall, the outcome seemed best described as a "small win"; perhaps just another example of the theory-practice gap that I had hoped this project would bridge.

Towards the project's end, however, my continuing reflection led to an exploration of chaos/complexity theory which gave new meaning to the concept of a "small win".

According to this theory, change is not the product of linear processes applied methodically in purposeful and diligent ways, but emerges from serendipitous events that cannot be planned for, or forecast in advance. When this perspective of change is applied to human organisations – in this study, a busy school – the context for change is recognised not as a stable, predictable environment, but as a highly complex system where change happens all the time, cannot be controlled, and no one can be really sure where the impacts might lead. This so-called "butterfly effect" is a central idea of this theory where small changes or modifications are created – the effects of which are difficult to know, let alone determine – and which can have large-scale impacts.

Allied with this effect is the belief that long term developments in an organisation that takes complexity into account, emerge by spontaneous self-organising evolution, requiring political interaction and learning in groups, rather than systematic progress towards predetermined goals or "visions". Hence, because change itself and the contexts of change are recognised as complex, chaos/complexity theory suggests that change is more likely to be slow and evolutionary – cultural change – rather than fast and revolutionary where the old is quickly ushered out by radical reforms and replaced by new structures and processes. Slow, small-scale changes are "normal", from a complexity viewpoint, while rapid, wholesale change is both unlikely and unrealistic. Therefore, the frustratingly slow, small-scale, imperfect educational changes that teachers create – including environmental education initiatives – should be seen for what they really are. They should be recognised as successful changes, the impacts of which cannot be known, but which have the potential to magnify into large-scale changes into the future. Rather than being regarded as failures for not meeting critical education criteria, "small wins" should be cause for celebration and support.

The intertwined phases of collaborative action research and individual researcher reflection are mirrored in the thesis structure. The first three chapters, respectively, provide the thesis overview, the literature underpinning the study's central concern, and the research methodology. Chapters 4, 5, and 6 report on each of the three action research cycles of the study, namely *Laying the Groundwork*, *Down to Work!*, and *The Never-ending Story.* Each of these chapters presents a narrative of events, a literature review specific to developments in the cycle, and analysis and critique of the events, processes and outcomes of each cycle. Chapter 7 provides a synthesis of the whole of the study, outlining my interim propositions about facilitating curriculum change in schools through action research, and the implications of these for environmental education.

Table of Contents

Abstract ii

List of Abbreviations ix

List of Figures x

List of Appendices xi

Acknowledgments xii

Statement of Originality xiii

Dedication xiv

Chapter 1: Introducing the Research 1

Introduction: A Personal Journey 1
Framing this Research: The Writer's Background and Interests 2
Aims, Questions and Objectives of the Research 5
Identifying the Areas of Literature Review 7
Sustainability: The Critical Concern 7
Environmental Education 9
New Theory for Educational Change 9
Approach to the Study 10
Critical Action Research 11
Conduct of the Study 11
Researcher Roles 11
Data Collection, Analysis and Interpretation 13
Research Origins and Context 14
Overview of the Action Research project 15
Stage 1: Antecedents to the Study 15
Stage 2: Development of a Learnscaping Curriculum 16
Stage 3: Implementation, Evaluation and Renewal 18
Significance of the Study 18
Thesis Outline 19

Chapter 2: Introducing the Critical Concern 22

Introduction 22
Challenges for the New Century 22
Issues of Concern 25
Children and the Environment 33
Creating Fundamental Change 38
The Goal of Living Sustainably 39
Education: A Catalyst for Change 41

Chapter 3: Creating the Research Journey 50

Introduction 50
Study Aim and Objectives 51
The Methodological Orientation 52

Methodological Influences and Contemporary Debates 54
Socially Critical Research 58
Issues, Dilemmas and Paradoxes in Conducting Action Research 70
Credibility and Validity in New Paradigm Research 80
Data Gathering: Finding out What is Going On 84
Recording and Storing the Data 93
Analysing, Interpreting and Reflecting on the Data 94
Reporting Action Research 97
Context, Background and Evolution of This Study *100*
The School Context 100
Learnscaping: Grounds for Learning 103
Overview and Evolution of this Action Research Project 106
Chapter Summary *114*

IN THE FIELD **115**

Chapter 4: Learning in the First Cycle *Laying the Groundwork* **117**

Introduction *117*
CYCLE 1: Laying the Groundwork *117*
Phase 1: Initial Impetus and Entry Into the Project (Dec 1996) 118
Phase 2: Finding Starting Points and Purposes (Dec 1996-Jan 1997) 118
Phase 3: Negotiating a Partnership (Jan-Feb 1997) 120
Phase 4: Searching for Purpose and Identifying First Tasks (Term 1, 1997) 122
Phase 5: Initial Plans and Actions: *Earthworm 1997* (Term 2, 1997) 125
Phase 6: Redefining the Project (Terms 3 and 4, 1997) 132
LITERATURE REVIEW: Environmental education *136*
Environmental Education: Its Nature and Principles 136
Key Principles and Features of Critical Environmental Education 142
Education for Sustainability 154
Concluding Comments about Environmental Education 157
OVERVIEW OF FIRST CYCLE *157*
Description and Critique of Curriculum Outcomes of Cycle 1 158
Lessons Learned about the Processes of Change 166
Creating My Personal Living Educational Theory 170
New Questions and Challenges 172

Chapter 5: Learning in the Second Cycle *Down to work!* **174**

Introduction *174*
CYCLE 2: Down to work! *174*
Phase 1: Redefining Research and Project Tasks (Dec 1997-Jan 1998) 175
Phase 2: Creating an Environmental Education Framework (Term 1, 1998) 180
Phase 3: Creating a Professional Development Framework (Term 2, 1998) 187
Phase 4: Staff Workshop 1 (July 1998) 194
Phase 5: Staff Workshop 2 (August 1998) 201
Phase 6: Teacher Curriculum Writing Continues (Term 4, 1998) 206
LITERATURE REVIEW: Environmental Education Revisited *212*
Exploring Integrated Curriculum 212
Exploring Whole School Environmental Education 216
Exploring Teacher Constraints in Environmental Education 219
Concluding Comments about Implementing Environmental Education 221
OVERVIEW OF THE SECOND CYCLE *222*
Description and Critique of Curriculum Outcomes of Cycle 2 222

LESSONS LEARNED ABOUT THE PROCESSES OF CHANGE 225
DEEPENING MY LIVING EDUCATIONAL THEORY ABOUT EDUCATIONAL CHANGE 228
NEW QUESTION AND CHALLENGES 230

Chapter 6: Learning in the Third Cycle *The Never-ending Story* **231**

INTRODUCTION *231*
CYCLE 3: THE NEVER-ENDING STORY *231*
THE FINAL PHASE (JAN 1999-JAN 2002) 233
LITERATURE REVIEW: SCHOOLS AND EDUCATIONAL CHANGE *243*
RETHINKING EDUCATIONAL CHANGE 243
NEW WAYS FOR EDUCATIONAL CHANGE: "GOING DEEPER AND WIDER" 254
LEARNING FROM PRACTICE 262
NEW LESSONS FOR LARGE-SCALE REFORM 264
CONCLUDING COMMENTS ABOUT EDUCATIONAL CHANGE 265
META-ANALYSIS, CRITIQUE AND SYNTHESIS *266*
DESCRIPTION AND CRITIQUE OF THE LEARNSCAPING MANUAL 267
TOWARDS A NEW UNDERSTANDING OF EDUCATIONAL CHANGE 270
MY NEW LIVING EDUCATIONAL THEORY: IDEAS IN PROGRESS 271
NEW CHALLENGES: DEEPENING AND WIDENING THE CAPACITY FOR CHANGE 274

Chapter 7: Small Wins to Large-Scale Change **277**

INTRODUCTION *277*
LEARNING FROM THE LITERATURE *277*
REVISITING THE LITERATURE SETS 278
WEAVING THE LITERATURE TOGETHER 279
LEARNING FROM PRACTICE: REVISITING THE PROJECT *281*
CYCLE 1: GETTING STARTED 281
CYCLE 2: DOWN TO WORK 282
CYCLE 3: THE NEVER ENDING STORY 283
MY LIVING THEORY: THEORISING ABOUT EDUCATIONAL CHANGE *283*
FOUR CHARACTERISTICS OF EDUCATIONAL CHANGE 283
THREE INTERIM CONCLUSIONS ABOUT CHANGE PROCESSES 285
IMPLICATIONS FOR ENVIRONMENTAL EDUCATION 289
MY LEARNING ABOUT COLLABORATIVE (ACTION) RESEARCH 299
CONCLUDING COMMENT *304*

Appendices **307**

References **326**

List of Abbreviations

ABS	Australian Bureau of Statistics
BTR	Board of Teacher Registration
EFS	Education for Sustainability
GEO 2000	Global Environment Outlook 2000
IUCN	The World Conservation Union
KLA	Key Learning Area
OECD	Organisation for Economic Cooperation and Development
P & C	Parents and Citizens Association
UNDP	United Nations Development Programme
UNEP	United Nations Environment Program
UNESCO	United Nations Education, Scientific and Cultural Organisation
UNICEF	United Nations Children's Fund
WCED	World Commission on Environment and Development

List of Figures

Figure		Page
1.1	Model showing the relationships between my research interest, the action research and the thesis research	4
1.2	Overview of the stages of the learnscaping curriculum project	15
1.3	Part of the school's Learnscape Circuit	16
3.1	Four paradigms of social inquiry	53
3.2	Koala corridor passing through the schoolgrounds	101
3.3	Map of the school's learnscape circuit	105
3.4	The three action research cycles and their phases	108
3.5	Diagram showing the evolution and research strategies of this action research	113
4.1	The six phases of the first cycle of this action research	117
4.2	The storyteller in action	126
4.3	Categories of ideologies of education	138
4.4	Hart's "Ladder of Children's Participation"	149
5.1	The six phases in the second cycle of this action research	174
6.1	The anticipated three phases in cycle 3	232
6.2	The actual final phase of cycle 3 of this action research	233
6.3	The three phases of change in a non-linear change model	254
6.4	Fullan's key attributes of educational change	263
6.5	Guiding questions, initial assumptions and evolving propositions about facilitating educational change	272-3
7.1	Cartoon "Meanwhile, deep in the Amazon jungle…"	306

List of Appendices

Appendix		Page
A	Full List of Case Record Contents	307
B	Letter setting out research protocols	314
C	Example of email as conversation	315
D	Example of email exchange as a log of events	316
E	Example of reflective journal entry	317
F	Example of Interview schedule	318
G	Excerpt from transcript of parent focus group interview	319
H	Email interview schedule with responses from storyteller	320
I	Evaluation sheet for assessing a *Five Star Bird Garden*	321
J	Journal entry illustrating emerging acceptance as researcher/ facilitator	322
K	Contents page of draft learnscaping program (June 1998)	323
L	Principal's letter of appreciation after workshops	334
M	Draft *Earth Carers'* Code	335
N	Contents page of final version of *Learnscapes Alive* (January 2002)	336

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Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Signature:…….

Date:…….

Dedication

I dedicate this thesis to my sister-in-law

Helen Josephson-Davis

(20/7/51 – 18/11/02)

and to my workmate

Cassandra Weddell

(12/7/61 – 30/1/03)

"Shine on you crazy diamond[s]"

from *Wish You Were here* (Pink Floyd, 1975)

Chapter 1: Introducing the Research

INTRODUCTION: A PERSONAL JOURNEY

This thesis tells the story of a research journey. In fact, it is the story of *two* journeys, overlapping and intersecting, but distinctly different. The first and central journey was an action research project, consisting of a series of action spirals, set in a primary school in Queensland, Australia, consisting of a series of action spirals. This project involved regular, on-going engagement with a range of participants – principal, teachers, parents and administration staff in the school – working directly and indirectly in the development of a whole school environmental education curriculum. The tangible outcome of this project has been *Learnscapes Alive* (Thurlow, 2001), a set of teaching and learning activities and teacher support materials. The second journey, derived from the first, has been the mainly solitary investigation in which I performed the recognised tasks of a qualitative researcher: reviewing literature, conducting interviews, analysing data, and theorising about meanings. The outcome of this second journey is this doctoral report.

At times, significant aspects of these two journeys coincided, for example, literature surveyed for the school-based project often became part of the thesis literature review, and vice versa. At other times, the intensity of the school project impacted adversely, for considerable periods, on the doctoral journey making it difficult to proceed with the thesis. Overall, the combined processes have been lengthy and challenging. Consequently, I developed symbolic "maps" and travel plans as I progressed to assist me to make sense of these journeys[1] and the complex interplays between them. Like many travellers, I took "snapshots", literally and metaphorically, of events and encounters. I kept extensive travel "diaries" in the form of detailed journal entries of feelings, perceptions, conversations, encounters and analyses of situations, problems and opportunities. I also kept "mementos" in the form of transcripts, email messages, letters and invitations as reminders of events and experiences. I then embarked upon writing a story of this journey using excerpts from these "travel documents", coupled with understandings gained from researching the "guidebooks" of relevant literature and from learning about the research journeys of others. The "travel report" is this thesis, a personal account that has facilitated the development of my "living educational theory" and that has helped reshape and refine my knowledge, beliefs and values about teachers, educational change and environmental education.

[1] This metaphor of the "journey" was inspired by Lotz (1996).

Writing this report to reflect this multifaceted, complex process has been a challenge. Hence, this thesis is organised somewhat differently to a conventional research report in order to give a rich sense of the research experience. It has been, as Winter (1996) writes, "an attempt to do justice to the always frustrating relationship between the linear sequence of words on a page, the infinite complexities of experience, and the desire to elucidate a wider significance from particular events" (p. 25). Therefore, while the first three chapters provide the thesis overview, literature review, and research methodology, chapters 4, 5, and 6 each contain a mixture of narrative, review of literature, analysis and critique associated with each of the research cycles. This structure, I feel, better reflects the research process.

FRAMING THIS RESEARCH: THE WRITER'S BACKGROUND AND INTERESTS

All journeys have a beginning and here I articulate a little of my background and interests that led to this research journey. As a teacher, parent and researcher, I have had long-term interest in education and environmental concerns. These first developed in the 1970s when I worked as a primary school teacher in an Indigenous community in North Queensland, Australia. The social and environmental effects of colonisation – evident in the "western" regimens of health care, welfare, justice and schooling – had failed the adults in the community[2] and were also failing the children. Schooling, as it has been practiced in Australia, is a continuing factor in the marginalisation of Indigenous people, rather than a force for social improvement and liberation (McConaghy, 2000; Schwab, 1999).

Later, as a parent of school children, my thoughts about the alienating effects of schools were reinforced rather than dispelled. Even in relatively affluent city schools, many parents and children are marginalised, social stereotypes are reinforced, and little contribution to sustainability is evident. Over the years, then, I have developed deep anxiety about current social and environmental conditions. This stems from the belief that social structures and processes, including education, not only alienate many people, but also marginalise or make invisible "natural" environments and human-environment relationships (Lucas, 1997). The latter is seen in the general neglect of environmental education in schools and in the poor state of most schoolgrounds (Rivkin, 1997; Smith, 1998).

Despite these concerns, however, I also believe that education *can* be transformative and not simply reproductive of damaging social and ecological conditions (Giroux, 1985;

[2] Adult Indigenous Australians experience much lower health levels and access to health services while life expectancy is 20 years less than for the general Australian population. Indigenous unemployment is over 25%, while the current rate for the general population is around 6.2% (ABS Papers 4704.0 & 6287.0).

Stevenson, 1987). I also believe that "transformative" education is crucial for the transition to sustainability[3], and that experiences *in, about, with* and *for* the biosphere are prerequisites (Fien & Greenall Gough, 1996; Gough, 1994). Such experiences, especially while children are young, are vital for them to care about and take responsibility for the natural world (Dighe, 1993; Wilson, 1994). This infers, however, that children will have adults around them who value nature as a powerful source of learning (Hart, 1997; Nabhan & Trimble, 1994).Therefore, in recent years I have been involved in action research projects to recreate educational settings, rather than focusing on the inadequacies of education. In particular, this has occurred through my involvement with socio-ecological "health promoting schools" and "holistic" approaches to environmental education in early childhood settings. These projects have sharpened my interest in transformative education.

Fortunately, signs of a "sea-change" in environmental education are emerging as the number and range of innovative programs grow.[4] Nevertheless, prior to and during this study, I questioned whether the needed changes were developing too slowly or would be adequate to meet the scale of the challenges. I was not alone in these thoughts. Wals and Alblas (1997), for example, have commented that "one could argue that despite their good intentions, many environmental education projects seem to fall short in realising ambitious learning goals" (p. 253). Also, Robertson and Krugly-Smolska (1997) write that "for teachers there is still a gap between many of the expectations of environmental education and what each is able, and willing to do within his or her teaching practice" (p. 312). They note that this "rhetoric-reality gap" (Fien, 1993; Robottom, 1987b) in environmental education appears to be endemic, with little assistance given to teachers to address it. Robertson and Krugly-Smolska (1997) emphasise, however, that attention should be paid to what *is* working, commenting that "We must start paying attention to the ways of knowing that really drive environmental action" (p. 49). This will lead, they suggest, to an appreciation of what teachers are trying to do and an understanding of the contexts in which they are working, rather than further proclamation of their shortfalls. This thesis is a response to this challenge. Figure 1.1 locates this purpose with my concerns about social and ecological sustainability and illustrates the relationship between the action research project and this doctoral study.

[3] A widely-accepted meaning of sustainability, discussed further in chapter 4, is: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 8).

[4] *Education and Sustainability* (2002) edited by Tilbury, Stevenson, Fien and Schreuder for the IUCN, outlines a wide range of innovative educational projects across the globe. A recent initiative in Australia is *Sustainable Schools* – a whole school approach simultaneously exploring sustainability through teaching and learning, school finances and management, and community links and community education.

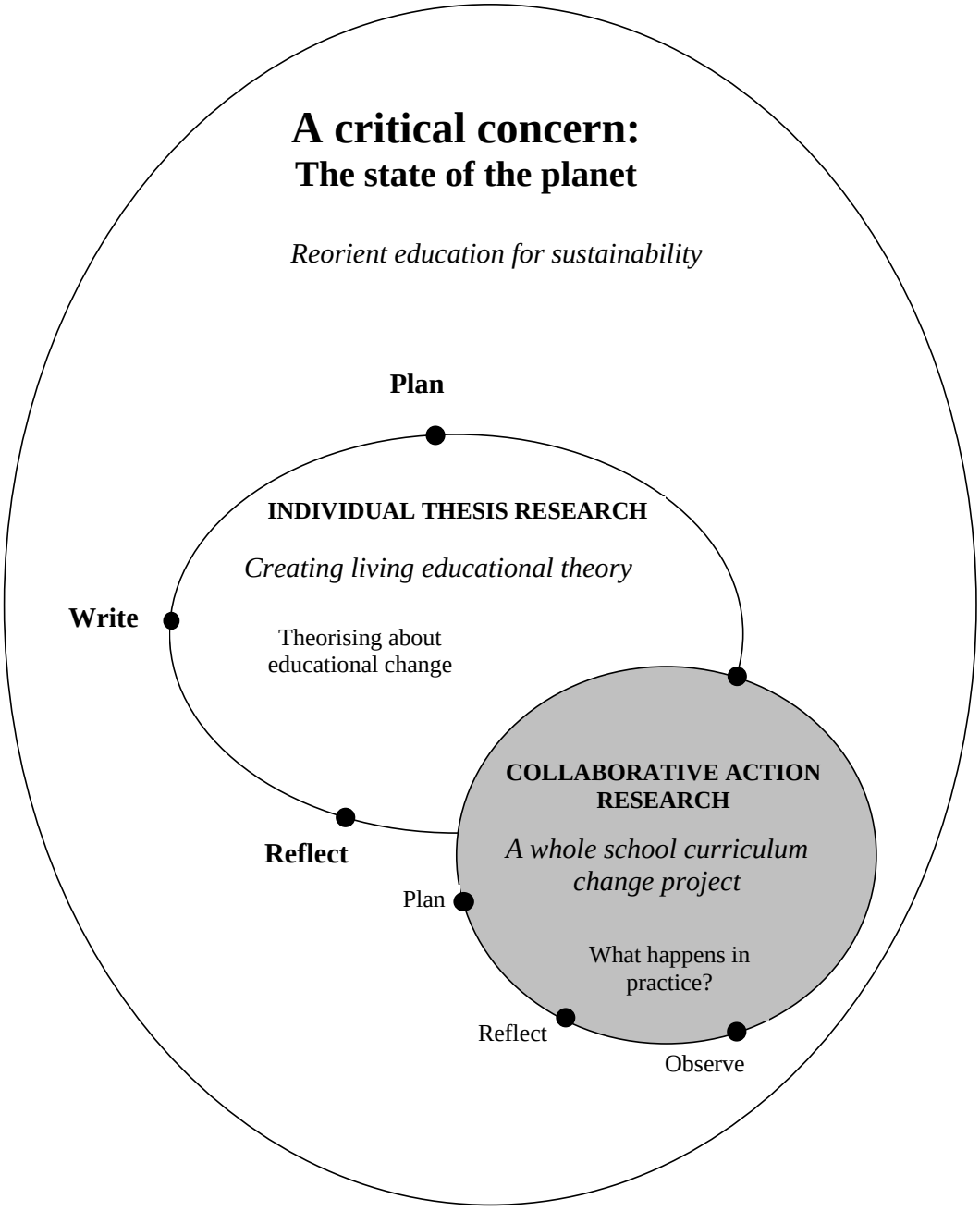

Figure 1.1. Model showing the relationships between my research interest, the action research and the thesis research.

AIMS, QUESTIONS AND OBJECTIVES OF THE RESEARCH

While there has been a strong personal element behind the motivations for this study, there has also been an overt purpose in terms of the field of education. The inquiry sought to address a common criticism of environmental education of a gap between theory and practice, often articulated as a criticism of teachers for failing to achieve the values and action objectives of critical environmental education. With this in mind, the specific aims of this study were to develop a critical environmental education curriculum in a school, and to investigate the issues, opportunities, constraints and dilemmas revealed in this process. The overarching research questions related to these aims were:

- *What are the characteristics of transformative education and how can education be reoriented for sustainability?*
- *How can critical environmental education be implemented in a school?*
- *What are the constraints and opportunities for school-based critical environmental education?*

Four specific research objectives were developed to address these questions. The four objectives were:

1. To "tell the story" of the development of a whole school curriculum innovation in environmental education;
2. To critique the processes and outcomes of this project;
3. To articulate "lessons learnt" about curriculum change; and
4. To add to discussion and debate about collaborative research processes in schools.

To achieve the first objective, a narrative account of this school's five-year experience in developing its environmental education curriculum innovation is presented. Narrative and story are identified by Elbaz in (Gudmundsdottir, 1995) as "the very stuff of teaching, the landscape within which we live as teachers, researchers and within which teachers can be seen as making sense" (p. 31). Storytelling offers "a kind of intermediate technology of research adapted to the study of practical problems in realistic timescales" and also helps to facilitate problem definition, state Goodson and Walker (1995, p. 187). Narratives are also valuable transformative tools that allow understanding of the world in new ways and assist in the communication of new ideas (Gudmundsdottir, 1995). Thus, telling the story of this environmental education project has been a way for me to understand the processes and outcomes of this innovation so that its telling is a coherent and compelling account.

To achieve the second objective, a detailed critique of this curriculum initiative was constituted and involved extensive in-depth documentation, analysis, interpretation and evaluation of the processes used to initiate and implement the initiative. This critique also included an exploration of the contextual factors that impinged upon the project – such as personal constraints, the impacts of competing school initiatives and events, and the effects of systems-level educational changes. An examination of the project outcomes was also integral to this critique.

The third objective involved deducing some "lessons" about curriculum, school and educational change generally, from the experiences of this particular study. As indicated earlier, a spur to this research were comments by Wals and Alblas (1997) that many environmental education projects fall short of expectations. Consequently, this research has investigated both the theoretical and practical constraints of implementing (environmental) educational change in schools while, concurrently, accepting the suggestion of Raffan (1990) and Robertson and Krugly-Smolska (1997) to also identify enabling qualities and conditions that promote and enhance successful innovation and change. Several propositions about (environmental) educational change and innovation that may be useful for others seeking to create and implement environmental education in their own settings are offered, although it is not the intention to propose a blueprint for other schools to follow. This discussion may also be useful in assisting other environmental educators to rethink what they consider to be failure and success in implementing curriculum change.

Finally, to achieve the fourth objective, I have explored the difficulties and dilemmas of conducting school-based collaborative action research. This investigation unearthed a range of research issues, including matters of participation and power, the multiplicity of researcher roles, and issues associated with establishing and maintaining momentum and interest in the project. The insights gleaned from this research project may further discussion about collaborative action research, both in schools and elsewhere.

In exploring these four research objectives, I have also created and recreated my own living educational theory, deepening my personal understandings of (environmental) education and how it is practiced. This has become a mixture of new and reaffirmed knowledge and processes which, as Kappeler (cited in Lather 1991a) states about research, contribute "not a set of answers, but making possible a different practice" (p. 159).

While at one level, this whole research experience has been a journey of learning about teachers, schools, environmental education and educational change – and therefore has relevance to the field of education – it has also been a very personal journey in the creation of what Whitehead (1989) calls "living educational theory". As Whitehead explains, such theory is "living" because it embodies systematic reflection upon one's own and other learners' day-to-day educational practices. Consequently, there are extensive narrative descriptions and explanations of present practice, evaluations of past practice and discussions for improving future practice in this thesis. A dynamic and living form of theory – changing and evolving with the practical experiences, personal reflections and public conversations of those involved – has been created. Accordingly, the theory developed here is presented as "work in progress" rather than definitive statements of truth, and is highly contextualised, rather than necessarily having broad applicability.

IDENTIFYING THE AREAS OF LITERATURE REVIEW

In this section I highlight the major areas of literature review associated with this study and in so doing outline my research rationale. The first area provides a discussion of "the critical concern" – a review of a broad range of literature focussing on global social and environmental issues and the challenges they pose, especially for children and future generations. Allied with this review is discussion of the transformative role of education as a catalyst for overcoming these challenges and for aiding the transition towards sustainability. This review comprises chapter 2. Chapter 3 contains a review of literature about the key characteristics of environmental education and its role as a catalyst for change in school education, and forms one section of the first cycle of this action research. This review is extended in chapter 4, which discusses the second cycle of this action research, and contains a review of literature examining issues associated with integrated approaches to curriculum, whole school environmental education and teacher constraints in the implementation of environmental education in schools. The final area of review, allied with the third action cycle examined in chapter 6, explores recent theories about school and educational change, and introducing chaos/complexity theory as a new way of thinking about educational change.

SUSTAINABILITY: THE CRITICAL CONCERN

We are currently in a period of increasing uncertainty, instability and rapid change with mounting concern about the repercussions of "development" approaches that ignore social cohesion and marginalise natural systems (UNEP, 2000; Worldwatch Institute, 2000).

Children have a very large stake in the future and are likely to bear the deferred consequences of economic, social and environmental decisions and actions currently being made or avoided. One of the tasks of society should be to equip children with the attitudes, values, knowledge and skills necessary to rethink and change existing patterns of action to secure healthy, just and sustainable futures for all (Slaughter, 1999). Yet there is growing evidence that young people, even the comfortable and relatively well-off, harbour pessimistic thoughts about the future and feelings of purposelessness about the present (Eckersley, 1999; Hicks, 1996). For the poor and poverty-stricken, more immediate consequences are apparent – lack of clean water and clean air; malnourishment; increased exposure to diseases thought to be eradicated; and significantly higher levels of sickness and death (McMichael, 2001b; UNICEF, 2000).

Trainer (1997) and Eckersley (1998) claim that these negative outcomes are the consequences of failing economies and social structures emanating from a failed industrial worldview. This worldview, built on "growth" economics and the dominance of science and technology, is a dated and "defective worldview that is constantly creating the social world and progressively destroying the natural one" (Slaughter, 1996b). The focus on material growth, the subjugation of nature and the marginalisation of non-Western cultures is a major impediment to a post-materialist world which embraces stewardship of Earth and the needs of future generations, claim Inayatullah (1998) and Slaughter.

As a result, Slaughter (1996b) argues that humans need social innovations that break from the "industrial fantasy" and reconnect us to each other and Earth. He also argues that we need to learn to live sustainably. He challenges society to let go of its industrial models and approaches that perpetuate non-sustainable futures, and to reorient to a connected and inclusive worldview. There is broad acknowledgment of the need for education to significantly assist in making such breaks. As UNESCO (1997) states, "It is widely accepted that education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow" (p. 15). However, education needs to break from its own outmoded, industrial models in order to be transformative, because by having developed as part of the dominant worldview, it helps to perpetuate it (Fien, 2001a; McMeniman, 1999; Slaughter, 1999). Significant changes in

systems and practices are necessary for education generally, and schooling[5] in particular, to contribute meaningfully to the transition to sustainability.

ENVIRONMENTAL EDUCATION

The knowledge, strategies and values of sustainability need to become essential components of education and schooling. Environmental education offers a way for this to occur with its focus on addressing environmental and social issues through socially critical pedagogical practices, and its support for interdisciplinary and transdisciplinary approaches for overcoming curriculum fragmentation (Fien, 2001b; Smyth, 2002; Tilbury, 1995). Generally speaking, however, environmental perspectives are neglected within mainstream education. This is despite the growing recognition of the importance of children's experiences with Nature as contributing to their concern for, and responses to, the natural environment (Hart, 1997; Nabhan & Trimble, 1994; Rivkin, 1995). While some schools and their communities *are* becoming aware of the need to incorporate environmental considerations into decision-making, nevertheless, embedding environmentalism is more than just tinkering with programs. Environmental education challenges the status quo of educational thinking and practice, and implies comprehensive innovation and change (Fien, 2001b; Sterling, 2001; Stevenson, 1987).

NEW THEORY FOR EDUCATIONAL CHANGE

Concurrent with this call for widespread school and educational change are a range of researchers and writers in the field of educational transformation and change (Fullan, 1993; Hargreaves, 1997b; Nias, Southworth, & Campbell, 1992; Tyack & Cuban, 1995). Indeed, literature from the early- to mid-1990s identifies several critical considerations for creating transformational change. These include: whole school change processes; inclusive, democratic ways of creating change; and professional development built upon teacher-identified priorities, as opposed to top-down bureaucratic change models. More recently, frameworks for change that build on chaos theory and postmodernist perspectives have helped to redefine what is deemed "failure" or "success" in terms of change and innovation (Fullan, 1999; Gunter, 1997; Larson, 1999). In addition, the compelling connections between research, curriculum development and teacher professional development identified by both environmental educators and educational change researchers, make robust

[5] "Education" is a term that encompasses non-school and informal modes of teaching and learning. "Schooling" refers to teaching and learning in the formal, and mainly, compulsory education sector.

argument for the use of action research as a key strategy for guiding school and educational change (Elliott, 1998; Hart, 1996; Kemmis & McTaggart, 2000; Robottom, 1994).

APPROACH TO THE STUDY

In this section I explain my research methodology and why collaborative action research was chosen as the research method. Many writers in the field of educational change (Elliott, 1998; Kemmis, 2001; Winter, 1996) and in environmental education (Hart, 1996; Robottom & Hart, 1993) consider action research to be highly appropriate for creating change and innovation because of its cyclical approach to problem identification, planning and action and its commitment to inclusive decision-making. I have been influenced by this literature over the years and had already co-facilitated a long-running action research project in another primary school.[6] There were similarities between this new project and the previous one in that both were whole school projects, both involved learnscaping, and both recognised the value of school-based teacher professional development as crucial to creating change. Consequently, identifying a broad critical methodological orientation[7] that had educational change as an outcome was, initially, not a difficult task. This was because of my earlier experiences and because school personnel involved in the "new" project were keen to develop new directions for environmental education in their school and were amenable to scrutiny of past, current and planned activities as a basis for "getting it right".

However, this study became a fusion of research approaches and methods. As well as being founded on critique and action, it also displays significant interpretative elements, showing the influence of qualitative research literature, in particular, narrative inquiry (Gudmundsdottir, 1995) and case study (Stake, 1995). In particular, this literature was invaluable for providing perspectives on ethical issues, research conduct, the role of the researcher and the application of techniques for collecting, recording and analysing data – such as journalling, interviewing and document review. As the research proceeded, however, it also became apparent that the design was an "emergent" one, in that it evolved as the study proceeded. Therefore, rather than having a pre-constructed design that guided the research process, the research developed as an open-ended, reflexive procedure, where it was constructed and investigated as it proceeded (Lather, 1991).

[6] See Davis and Cooke (1998) for a comprehensive account of this earlier project.
[7] Chapter 3 provides a detailed account of this research methodology.

CRITICAL ACTION RESEARCH

Though seemingly complex, the overarching research method – action research – is relatively simple. A central notion of action research is that there are recurring cycles of planning, action and evaluation – built on the principles of problem solving – and based upon reflective, critical assessment of an existing situation, ownership by participants, and collaboration leading to concrete action and change (Jensen, Larsen, & Walker, 1996; Kemmis, 1994; Wadsworth, 1998). Change is not simply a benefit of the research process; it is fundamental to it and happens throughout.

According to Winter (1996), action research is particularly useful for investigating professional experience. This is because it links practice and the analysis of practice into a single productive and continuously developing sequence, and "links researchers and research participants into a single community of interested colleagues" (p. 14). Extending this idea further, MacNaughton (1996) asserts that the central aim of action research, as a practice of critical educational science, is to generate knowledge that is practical, strategic and based in the practices of everyday educational endeavour. She suggests that one of the primary functions of action research is to uncover ideological distortions and structural constraints to change. Furthermore, she emphasises that it must be practical as "the aim… is to create wiser and more just educational practices" (MacNaughton, 1996, p. 31). Using the term inspired by McTaggart and Garbutcheon-Singh (1988), MacNaughton refers to this kind of action research as "fourth generation" action research because it developed from earlier forms of action research and explicitly seeks to contribute to a changed and improved world where critical reflection and social critique are key research processes in changing existing social practices.

CONDUCT OF THE STUDY

This section provides a brief overview of the conduct of this research with particular focus on my roles as an action researcher in the study. It also highlights my approaches to data gathering, analysis, interpretation and reflection within this action research framework. These matters are then expanded upon further in chapter 3.

RESEARCHER ROLES

The kind of collaborative action inquiry reported in this thesis was not research conducted *on* the school by the researcher but was research *by*, *with* and *for* the school (Kemmis, 1994; Reason & Bradbury, 2001a; Wadsworth, 1998). In this kind of research, the

researcher is not a neutral observer but is intrinsically involved with the setting, the people, the processes of change and the research outcomes. This kind of researcher role is both complex and problematic, with four key issues emerging. Firstly, from the project's inception, I saw myself as a "change agent", and as the research progressed, I adopted the term "researcher-facilitator" to better describe this complex role. However, even as a researcher-facilitator, I played multiple roles – confidant, expert, colleague, theorist, novice, manager and director – roles that are explained in greater detail later in the thesis.

A second issue concerned my level of activism in the project. Ultimately, I took quite a minimalist role as facilitator, rather than a strongly activist one. Early negotiations and reflections about my role and purpose in the school helped temper any thoughts about becoming an overt leader of change. Essentially, these negotiations centred on my desire to avoid being cast as an environmental education "expert" and being allocated the full task of creating the learnscaping curriculum. Initially, I sensed that there was an expectation that the project would proceed with me in this expert role. In fact, I struggled against this expectation at many points throughout the project and it was not until quite late in the process that I felt this had largely been overcome.

A third complicating aspect of my role as researcher-facilitator in the school related to the nature of the "insider-outsider" relationship. Unlike my previous action researcher role in the Ashgrove Healthy Schools Project (Davis & Cooke, 1998) where I was "inside" being a parent of children in the school, I was more an "outsider" in this learnscaping curriculum project. Despite supportive claims to the contrary by the principal and others, and although conscious efforts were made to help ameliorate this, being outside the organisation meant that involvement was inevitably somewhat disjointed and incomplete.

A fourth complicating dimension to my role as a researcher was that I was a volunteer. Indeed, the whole project was voluntary for all involved – teachers, administrators and parents, as well as for myself. Combined with the day-to-day "busy-ness" of schools, all participants had to juggle commitments, not only to the project, but also to our paid work, our families and our other personal, professional and community responsibilities. The result was that the project often progressed slowly and erratically as competing priorities emerged or diminished. Nevertheless, a satisfactory outcome and an end to the project were finally achieved, though these took far longer than anticipated. Indeed, the slowness of the project became a central theme of this research, an issue that is explored in detail in later chapters.

DATA COLLECTION, ANALYSIS AND INTERPRETATION

This project utilised a range of qualitative tools for data collection, which were applied in a "naturalistic" manner in order to provide the best opportunities for reflexive and deep understandings (Stake, 1995; Walker, 1985). These tools were used to explore the context, record events, validate perceptions and search for meanings, issues and contradictions. The following list identifies the major data gathering tools that were utilised:

- participant observation;
- recording of meetings, conversations and events;
- electronic "conversations" with key participants;
- individual face-to-face interviews with key participants;
- focus group discussions with teachers and parents;
- an electronic interview with a "consultant" participant in the project;
- extensive journal writing for capturing personal reflections and perceptions;
- gathering and/or viewing of project and school documentation; and
- photographs.

The wealth of data gathered was compiled into a data record.[8] Data were then categorised and explored further to get "below the surface" of ideas, relationships, events and perceptions, which then assisted in the formulation of appropriate actions. However, the study did not progress in a linear fashion. There was continuous interweaving of data collection, analysis and interpretation, leading to plans and actions, throughout the life of the project. Opportunities for developing understandings about the context, validating perspectives by the field, revising ideas in the light of alternatives, and planning actions based on these multiple perspectives and inputs, occurred continuously (Winter, 1996).

Consequently, I had formulated a number of propositions about school change and innovation by the end of the study's first cycle, well before detailed and formal analysis and interpretations of data were undertaken. These were developed further as the project proceeded through later cycles. One early proposition, for example, related to the

[8] This is a complete collection, filed chronologically, comprising four large folios. These contain all printed documents, transcripts, meeting notes, email messages, and journal entries collected over the life of the project. This record is stored for safekeeping, and any future retrieval, in a university office. See Appendix A for an overview of its contents.

importance of professional development for the teachers in terms of creating curriculum change. Professional development then became a central aspect of this project.

RESEARCH ORIGINS AND CONTEXT

My involvement in this research project began at the conclusion of a professional development workshop that I had co-presented in late 1996, about ways of incorporating environmental education into early childhood education settings. One of the participants asked for information about developing a "learnscaping"[9] curriculum for the school at which she worked. The school had recently completed a large-scale landscaping project aimed at grounds redevelopment and was looking to capitalise, educationally, upon these improvements. The hope was to develop a curriculum to support environmental education and cross-curricular teaching and learning so that the gardens and grounds would become "outdoor classrooms" – sites where teachers and students could engage in enjoyable and meaningful learning outdoors. As I was just beginning to explore options for a doctoral study I recognised this request as a potential research opportunity. Consequently, at the beginning of 1997, I negotiated a research proposal with the school principal, a keen advocate of environmental education, and the teacher identified as the key proponent of environmental education in the school. Thus began this action research project, the development of a whole school curriculum centred on the concept of learnscaping.

The school, Fernwood State School[10], has a record of educational innovation such as a multi-age approach[11] to school and classroom organisation. This medium-sized school, with a student population of around 500, was established in 1983. The school serves a middle to upper socio-economic community and is situated in Logan City, on the fringe of Queensland's capital city, Brisbane. This social advantage is matched by significant environmental advantages, for example, the school is sited immediately adjacent to a large bushland reserve which is a protected koala habitat. In fact, the schoolgrounds are part of the koala corridor that links the reserve to other koala habitats in the area. Consequently, koalas and other wildlife are regular visitors to the school, resulting in high levels of interest in, and concern for, environmental issues in the school and local community.[12] The school has a well-established reputation for its environmental programs and has won a

[9] This is teaching and learning centred on the schoolgrounds, a concept explored further in chapter 3.
[10] This is a pseudonym selected to maintain the anonymity of the school, administrators, teachers and parents.
[11] Students of various ages, especially siblings, are in the same class. This is also called 'family grouping'.
[12] The school motto is "Quality education in a natural, caring environment" (Information Brochure, 2000).

number of state and Australian national awards for environmental education, particularly in relation to koala conservation and habitat protection.

OVERVIEW OF THE ACTION RESEARCH PROJECT

In this section I provide an overview of the action research project, instigated to develop a learnscaping curriculum for this school. However, this project has been just one facet of a much longer program in environmental education in the school, as illustrated in Figure 1.2.

LEARNSCAPING CURRICULUM PROJECT

STAGE 1: ANTECEDENTS to the STUDY (prior to 1997)
- *Project Club* – rainforest generation, frog-breeding, breeding Gouldian finches
- competitions and awards eg *Earthworm, Tidy Schools, Cash-for-Cans*
- major grounds redevelopment – groundwork for learnscaping

STAGE 2: DEVELOPMENT of the LEARNSCAPING CURRICULUM (1997-2002)
Cycle 1: Getting Started (1997)
Cycle 2: Down to Work! (1998)
Cycle 3: The Never Ending Story (1999-2002)

STAGE 3: IMPLEMENTING the CHANGES (2002 and continuing)
Cycle 4: Implementation, Evaluation and Renewal

Figure 1.2. Overview of the stages of the learnscaping curriculum project.

STAGE 1: ANTECEDENTS TO THE STUDY

Fernwood State School has a history of participation in environmental education spanning the school's early years. This includes involvement in a range of formal and informal projects consisting of the *Birds and Trees Project Club*,[13] and participation in various competitions and award schemes such as *Tidy Schools*,[14] *Earthworm*[15] and *Cash-for-Cans*[16] as well as a major landscaping project completed in late 1996. This early period was largely the effort of a classroom teacher, Jo, who initiated the *Project Club*. The club's major ongoing project is the development of a rainforest and the breeding of endangered finches and quails. Activities also include breeding endangered native frogs, restoring degraded

[13] *Project Club* is a student-led group involving students in practical activities such as tree planting.
[14] This scheme originally focussed on litter and recycling. Now it is "Green and Healthy Schools".
[15] The Earthworm Awards were an initiative of the *Australian Science Teachers' Association* and rewarded schools for activities related to a broad range of environmental/ecological activities.
[16] This project facilitates the recycling of drink cans and reimburses schools for the quantity collected.

areas in the schoolgrounds, maintaining a school-wide composting program, and encouraging ecologically-sound weed control. In the mid-1990s, environmental learning in the school was expanded through participation in the *Earthworm* Environmental Awards.[17] The school has won these awards, at both national and state levels, on numerous occasions.

In 1996, the school received financial assistance from the state government to redevelop its grounds, primarily for the protection and preservation of koala habitat (the school adjoins a conservation park and is located in a koala corridor). Planning for this redevelopment involved a high level of input from teachers, parents, students, and the wider community. It was proposed that the grounds, as well as protecting koalas, should also serve to enhance outdoor teaching and learning and inspire indoor activities. When finally completed for the start of the 1997 school year, the grounds featured a number of thematic gardens and habitats[18] connected by a *Learnscape Circuit*, which weaves around and between the many buildings of the school (Figure 1.3).

Figure 1.3. Part of the school's learnscape circuit.

STAGE 2: DEVELOPMENT OF A LEARNSCAPING CURRICULUM

Stage 2, from 1997-2001, is the action research project upon which this thesis is based, a learnscaping curriculum project that evolved to add educational value to the earlier grounds redevelopments. The practical outcome of this stage has been a two-part manual for teachers entitled *Learnscapes Alive*. The first section comprises background and information related to environmental education and the school's history of involvement

[17] This involved whole school integrated activities on themes such as: *Keep Koalas in our Community* (the implications of a proposed tollway) and *Beat the Heat* (the dangers of bushfire on flora and fauna).
[18] These themed gardens are: Colour Garden, Scent Garden, Shape Garden, Line and Texture Garden, Koala Corridor, Aboriginal Food/Use Garden, Rainforest, Wildlife Habitat, and Growing Garden (shadehouse).

over the years. The second section has an extensive set of cross-curricular ideas, activities and strategies, either written or compiled by the teachers, aimed at facilitating outdoor and environmental learning in each of the areas of the *Learnscaping Circuit*. The following section outlines the three action research cycles that comprised Stage 2.

Cycle 1: Getting Started

Cycle 1 lasted throughout 1997 and largely concerned clarification of the research project. This included the negotiation of roles and research approach, building relationships with key individuals and learning about the school context. Overall, I was more an "observer" than a "participant". An important aspect of learning was an investigation into the school's past and current environmental activities, mainly through document review, interviews and reflections in my research journal. Additionally, school visits also became opportunities to clarify the school's intentions regarding the project and to establish and consolidate working relationships. However, I did have some involvement in curriculum development through the *Earthworm* project, entitled *Explore Outdoor*. This involvement centred on my suggestion for utilising a storyteller to help children create class stories about the various gardens in the *Learnscaping Circuit*. In effect, this initiative provided a "first run" in creating curriculum based on the school's new gardens and habitats. However, by year's end, a degree of inertia had emerged in relation to the learnscaping project, especially as end-of-year activities and alternative projects encroached upon teachers' time and energy.

Cycle 2: Down to Work

Cycle 2 lasted for two years and involved the development of proposals for action and an intensive action phase. This action involved professional development workshops that I facilitated with the whole staff, followed by curriculum writing sessions in which small groups of teachers worked together to develop teaching and learning materials that linked gardens and curriculum content areas. At the end of the first twelve months, the learnscaping curriculum had begun to take shape and was generating a high degree of commitment and interest amongst the staff. Momentum was lost again, however, over the six-week summer holiday break. The following year (1999) saw the near-completion of all written tasks, including the editing and compilation of teachers' materials in readiness for publication. During this latter phase, my role was essentially that of motivator, keen to facilitate the completion of the task, but well aware of a range of personal and contextual constraints that impacted negatively on progress. It was anticipated, however, that the

document would be ready for the beginning of 2000, and that teachers would then commence use of the curriculum materials with their students.

Cycle 3: The Never Ending Story

Unfortunately, even this revised target date passed by, and so began a two-year period of setting new dates and watching these also pass. While the "stop-start" nature of the project was a source of frustration, it was also one of increasing appreciation of the complexities of implementing change in a school. In fact, my research into new areas of theory about educational change flourished during this period. At the school level, I continued in my roles of supporter, motivator and listener, seeking to keep the project "alive" and to slowly move it to completion. Although there were times when I thought that the project had finally foundered, *Learnscapes Alive* was finally put to print in December 2001. At the end of January 2002, the manual was officially "handed over" for teachers' use.

STAGE 3: IMPLEMENTATION, EVALUATION AND RENEWAL

Stage 3 commenced in 2002 and has seen the implementation of the learnscaping curriculum into day-to-day activities. I had initially thought that this would be part of the action research project. However, as completion of the final stages of *Learnscapes Alive* took so much longer than intended, a cycle of implementation, evaluation and renewal was outside the scope of this study. Nevertheless, at the hand-over, areas for further development were suggested, including linkage of content in the manual to the outcomes of newly released *Studies of Society and Environment* syllabus.[19] Ideas were also put forward for a new project to connect learnscaping with *World Environment Day* and the *Year of Eco-tourism* activities. On June 6 2002, the school celebrated these events with a half-day of environmental activities, aimed at demonstrating to the local community the value of the project and the school's role in the protection and enhancement of its local environment.

SIGNIFICANCE OF THE STUDY

This study has significance in a number of ways. For the teachers, a learnscaping curriculum resource, containing a wide range of practical, outdoor, environmentally oriented activities has been completed. Additionally, the professional development associated with this project has provided opportunities for teachers to expand and enhance their social and pedagogical practices.

[19] This is the mandated syllabus recently developed for Queensland schools and released in 2001. It provides an outcomes-based framework for teaching and learning about social and environmental topics and issues.

The research has also expanded understanding of change and innovation in (environmental) education. Collaborative action research has been reified as an "ideal" research mode for environmental education, yet there is an absence of accounts of such research projects in the literature (Gough & Reid, 2000). This project has sought to fill this gap as it seems that few environmental education researchers have actually undertaken this kind of research. As Winter (1996) indicates, this form of research "tests" theory in practice and, in a contrary move, encourages practice to question theory. Through such reflexive and grounded critique and practice, this project makes a contribution to both the literature and the practice of (environmental) educational change.

Professional environmental educators and researchers often blame teachers for shortcomings in environmental education practice (Wals & Alblas, 1997). This research, however, identifies a broad range of educational, personal and contextual factors that contribute to the perceived inadequacy of their efforts and the slow pace of change, with many of these lying well beyond teachers' direct influence. Overall, this research explains some of the gaps between rhetoric and reality, deepening understanding of the challenges and barriers to environmental education in schools. However, by paying attention to what does work in environmental education (Raffan, 1990), it also contributes to the body of practices that have had success in guiding teachers past these limitations. Thus, by seeking to honour the work of the many teachers who are trying to "make a difference", it offers support for others in education seeking to make their contributions to sustainability.

Finally, this research is significant for its impact on my own learning. This study has seen continuous exploration, clarification and change in my ideas and understanding about schools, curriculum development, educational change and the conduct of (action) research. Through these processes I have been creating my own "living educational theory" (Whitehead, 1989), a personal synthesis of the many strands of research and activity in which I have been engaged. How I now think about environmental education and educational change, how I relate this to my work as a teacher educator, and how I relate to teachers "in the field" involved in creating change have been transformed forever.

THESIS OUTLINE

This thesis has been structured within a research framework that challenges, somewhat, the conventions of research reporting. While the first three chapters are orthodox, chapters 4, 5, and 6, as the following chapter outlines indicate break with the traditional pattern.

This first chapter has delineated the research journey, identifying my background and interests in this field of study and with this form of research. It provides an overview of the research project, briefly describing the three research cycles that evolved during this project. The conduct of the research has also been described. The first chapter concludes with statements about the significance of the study, and this thesis outline.

Chapter 2 explains the "critical concern" that underpins the research. In so doing, it explores issues of global population growth, resource depletion, growth economics, urbanisation and social inequalities. Real and potential impacts of these issues on children and future generations are emphasised. A significant role for education as a contributor to social and environmental change is argued for, as well as recognition that education has been "part of the problem" in promoting and maintaining unsustainable ways of living. The chapter concludes with a discussion of the attributes of transformative education considered necessary if education is to help play a guiding role in the transition towards sustainability.

Chapter 3 explains the methodological approach that underpins the study, locating it within a critical theoretical paradigm. It discusses how action research fits within the critical approach and its relevance to environmental education. This chapter also discusses key principles of critical action research. In addition, the chapter explores some of the issues, dilemmas and paradoxes involved in conducting action research – particularly the multiple roles of the action researcher, issues of power and collaboration, and the difficulties of establishing and maintaining effective working relationships. There is also discussion of issues around credibility and trustworthiness of research conducted within a critical, participatory research framework. The chapter also includes discussion of the tools and techniques deployed in data gathering, analysis, interpretation and reflection, along with justification of the reporting strategy used in this thesis. The chapter concludes with an overview of the context of the study and how the research project unfolded.

It is in chapters 4, 5 and 6 where variation from a traditional thesis structure is evident. Chapter 4 introduces the first of the three cycle chapters, each of which contains three distinct parts. The first section of the chapter is a narrative account of the six phases that made up this first cycle. Discussion of the research protocols and processes that were relevant to each phase, as well as an account of the analysis and reflection that developed in each of these phases, is provided. The next part of the chapter is a review of literature about environmental education, the major area of literature that was examined during this cycle. The third part of the chapter provides a meta-analysis, a critical reflection exploring ideas

of significance that have become apparent through examination across the whole of the first cycle. This includes a critique the outcomes generated in this first cycle and of the research processes that were utilised. It also presents my developing ideas about educational change, environmental education and action research, drawn from the experiences of this first cycle, and that shaped thinking and actions in later research cycles.

Chapter 5 follows a similar structure, explaining the experiences and phases of the project's second cycle that were primarily concerned with the actions of teacher professional development and learnscaping curriculum writing by the teachers. The associated literature review for this chapter focuses on holistic education and curriculum integration, these having emerged as major areas of interest during this cycle. As in chapter 4, the third part of the chapter concludes with a critique of project outcomes and research processes, and discussion of my ideas about educational change, environmental education and action research, as shaped by the actions and reflections of Cycle 2.

Chapter 6 details the events, processes and personalities involved in the third and final action research cycle. The relative lack of action during this cycle provides the main issue analysed and discussed in the first part of the chapter. In the second section, the literature review centres on educational change, and the application of chaos theory to such change. The third part is a critique and reflection of the whole of this action research. Central to this meta-analysis is the articulation of the major lesson learnt from this research. This is that the *Learnscapes Alive* manual, while not expected to have revolutionary impacts on the school, or on environmental education, or on changing education generally, nevertheless represents a "small win" for sustainability, and this is substantial and significant.

Chapter 7 proceeds beyond the particulars of the study and looks deeper and wider (Hargreaves, 1997b) at its implications. It is in this chapter that my own living educational theory about environmental education and curriculum and educational change is articulated. The case is made for broadening the theoretical base of environmental education to consider new theory such as chaos theory. This is because it offers an alternative way of viewing many educational change experiences. Instead of seeing these as limited, or even failures, because they are slow to develop or seem to have minimal uptake or impact, they should, instead, be recognised as precursors of larger scale transformations. The consequences of this changed thinking leads to propositions about ways to further develop environmental education in schools. Finally, the chapter concludes with some ideas and challenges in relation to the conduct of action research, finishing overall on a hopeful note.

Chapter 2: Introducing the Critical Concern

INTRODUCTION

In chapter 1, I introduced the critical concern that provided the impetus and rationale for this research journey. In chapter 2, I articulate this concern more fully, moving beyond the expression of personal apprehension about the state of the planet to an examination of the broader literature that helps explain this concern. In so doing I argue the worth of this study and the action research project on which it is based.

The following review of literature explores the nature of the social and environmental challenges currently facing humanity, and which are expected to intensify in the future. A significant aspect of this review relates to how these challenges currently impact upon children and the potential impact on future generations unless social and ecological changes are made. The need for change from non-sustainable futures to more socially and ecologically sustainable ways of living is discussed, and well as the pivotal role of education as a catalyst for such change, which currently offers limited opportunity to engage children with these challenges. This literature review concludes with an analysis of transformative education approaches, the attributes of transformative teachers, and the characteristics required of learners so that the transition to sustainability can be achieved.

CHALLENGES FOR THE NEW CENTURY

The current era is commonly characterised as one of increasing uncertainty, instability and rapid change, presenting both major problems and profound possibilities. Today's children are likely to live their entire lives in circumstances of change, with their experiences of environments – natural, social, cultural and virtual – very different from those of just one generation ago. In some respects individual options have been hugely expanded. For example, the internet enables access to huge amounts of information, entertainment, commerce and communication possibilities across the globe, in rapid time. Children of developed nations have far more material possessions, and far more freedoms and rights in law, than at any time in the past. Their choices, especially, seem endless.

Nevertheless, while governments around the world are striving for higher standards of living for their populations through technological and economic growth, there is also mounting concern about the consequences of development approaches that continue to ignore issues of social cohesion and the marginalisation of natural systems. Many decision-makers, politicians and economists included, pursue policies that presume there are no

limits to economic and material growth. Increasingly, however, others in the community believe that the human species is living far beyond its means. Lester Brown of the Worldwatch Institute (2000) argues that, while the fast-evolving global information economy is currently affecting every facet of our lives, environmental trends will ultimately shape the new century. He states that it would be a mistake to confuse the vibrancy of the virtual world with the increasingly troubled state of the real world.

The Society for International Development (1999) also notes these paradoxes and reports that, in relation to the rapidly changing global economic conditions:

> Globalisation has ushered in a new epoch in world politics somewhat conflictingly characterised by rapid economic transformation, new trade regimes and a growing increase in the poverty gap, along with revolutionary electronic communications and the hope held out by the new transnational social and political movements. (para 1)

Brown also states that the scale and urgency of the challenges facing us in this new century are unprecedented and that we cannot overestimate the urgency of stabilising the relationship between humans and natural systems. He comments that "If we continue the reversible destruction of these systems, our grandchildren will never forgive us" (para 25).

This view is also shared by Guest, Douglas, Woodruff, and McMichael (1999) who warn that "the combination of population size and the intensity and waste-generating capacity of our consumer economies is now so great that we are disrupting some of the world's great natural systems" (p.15). These comments also reinforce the concerns expressed by McMichael (2001b) that the human species conceivably faces threats to its own survival within several generations because of its disruptions of Earth's life-supporting ecosystems.

The seriousness of these changes is reflected in a growing list of social and environmental problems. These include: global warming, threats to biodiversity, diminishing fresh water supplies, destruction of rainforests, accelerating rates of land degradation, heavy reliance on non-renewable energy in wealthy countries, on-going use of toxic chemicals in global food chain, rapid urban growth, continued production and sales of military weapons, escalating violence around the world, changing human migratory patterns and environmental refugees. Furthermore, the negative impacts of this crisis of sustainability are not evenly distributed throughout the world. As Lowe (1999) remarks, while some are enjoying the benefits of increasing globalisation and technology, others are bearing the risks and costs – with the poorest nations and the poorest people within nations most at risk.

The need for fundamental change in relationships between humans, and between humans and the natural environment, is clearly evident and becoming more urgent. In 1993, The Union of Concerned Scientists released their *Warning to Humanity* which states:

> Human beings and the natural world are on a collision course…If not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know. (para 1)

In 1997, this same group released a *Call for Action* urging all government leaders to act immediately to prevent the potentially devastating consequences of global warming and to demonstrate a new commitment to protecting the global environment. At the international level, the report *Global Environment Outlook 2000* (UNEP, 2000) states, "The continued poverty of the majority of the planet's inhabitants and excessive consumption by the majority are the two major causes of environmental degradation. The present course is unsustainable and postponing action is no longer an option" (p. xxix). As the Worldwatch Institute (2000) points out "Nature has no reset button" (para 25).

These comments indicate the urgent challenge that confronts humanity on a global scale in relation to the sustainability of our social and environmental systems. While these issues pose significant threats for everyone, it is children and future generations for whom the implications are most profound (Hicks, 1996; Slaughter, 1996a). Children already carry with them the accumulated harm of environmental problems created in times past. To this is being added the consequences of the economic, social and environmental decisions and actions that are currently being made, and avoided, by their parents and others.

Children and young people need to be prepared for a rapidly and radically changing world. This does not mean that adults can "give up" on children or on the planet, and relinquish responsibility for environmental and social damage, and simply pass the problems on. Instead, it means that adults need to work with children and young people to empower them so that they learn to influence the changes and ultimately to transform the status quo. Education has a pivotal role in this process (Fien, 2001a; Hart, 1997; Sterling, 2001) as has been stressed major international reports of recent years (UNEP, 1991; WCED, 1987). Given the scale of the challenges, it is now necessary to critically examine and make significant changes to the content and approaches of education so that the transition to sustainability is no longer delayed.

ISSUES OF CONCERN

The forces that are driving global change are a complex mix of economic and political factors, magnified by increasing rates of resource consumption allied with population growth (UNEP, 2000; United Nations Department of Public Information, 2000). The full extent of the interrelationships between these factors and how they influence each other are far from being adequately understood. While there is no universally accepted set of the most significant factors contributing to this global crisis, most sources canvass the issues explored in this section in some way. These issues are: population pressures, resource consumption and environmental degradation, urbanisation and industrialisation, social inequity and the wealth gap, and "growth" economic development models and their nexus with scientific and technological determinism.[20]

Population, Resource Consumption and Environmental Degradation

A critical factor driving global environmental change is human population growth with its clear links to consumption, resource depletion and environmental degradation. The world's population is growing by around 77 million people each year – mostly in the world's poorest and least prepared countries – and reached six billion in 1999. It has taken less than forty years for the world's population to double from three billion in 1960 and only 11 years since the world total was five billion. At the turn of the twentieth century, there were just one billion people on Earth and, even though the growth rate is now in decline, by 2050 it may grow to nine billion (United Nations Population Fund, 1999). Population growth trends in Australia have paralleled world trends, having doubled in the past forty years (O'Connor, 1999). Population Action International (1997) comments that the current size of the human population, and the additions made to it, are unprecedented in history and that today's growth rates cannot continue indefinitely.[21] The predictable consequences of population pressures include rapid urbanisation, possible further reductions in living standards, lower per capita investments in social services, education and health, and increased environmental distress and degradation (UNESCO, 1997).

In addition to worldwide population pressures, there are increasing demands in all economies for improved living standards, with rising expectations for material comfort and

[20] These categories have been developed after reviewing an extensive range of government and non-government sources. Additionally, works by authors who make cross-disciplinary links between their specialisations and environmental issues, in a range of fields including health, economics, science and law, were consulted. These include Labonte (1993), Low & Gleeson (1999), and Shearman (1999).

[21] A report in *The Australian* (3/2/03) refers to a UN report which indicates that world population projections and global birth rates are, at last, beginning to show significant declines.

higher levels of consumption. Suzuki (1998) writes that as humans strive for increasing wealth, resources are being used at faster and faster rates with a decreased capacity of both natural and social systems to support these demands. In the so-called "developed" world, the highly industrialised nations – mainly of the northern hemisphere but including Australia – and in the more prosperous parts of the "developing" world, such as Malaysia and South Korea, the magnitude of economic activity is causing environmental damage on a global scale with widespread pollution and disruption of ecosystems. However, in other parts of the developing world widespread poverty combined with rapid population growth often compels acceptance of widespread degradation of renewable resources – primarily forests, soils and water – leading to acceptance of higher levels of pollution and lower levels of control (UNESCO, 1997).

Consequently, UNEP's GEO 2000 Report outlines full-scale emergencies in a number of areas including the world water cycle, land degradation, air pollution and global warming. There are also major public health concerns with the return of "old" diseases to new places in epidemic proportions (such as malaria in Europe) and the emergence of new diseases, particularly those that appear to jump species from animal to human, such as Ebola and HIV/AIDS (McMichael, 2001b). By the end of 2000, a total of around 13 million children will have lost their mother or both parents to the AIDS pandemic, mainly in Africa and south-east Asia (UNICEF, 2000). As Guest et al. (1999) comment, "We can be relatively confident that the emergence of HIV/AIDS, an entirely unpredicted threat, is a harbinger of future environment-related events on the world communicable diseases scene" (p. 19).

The impacts of human actions deriving from population pressures and resources consumption also critically affect other species. As the GEO 2000 Report states, "It is too late to preserve all the biodiversity our planet once had" while Suzuki (1998) comments that the many non-human species that have already disappeared or are facing extinction should be seen as "the canaries in the coal mine" for human life. The seriousness of these impacts has prompted United Nations Department of Public Information (2000) to write "The inertia of affluence, the push of poverty, the soaring population are key macro–social issues that are impinging directly and urgently upon natural systems and their capacity to support these self-same influences" (p. 188). McKibben (1990) states, "If the end of nature were still in the future, a preventable possibility, the equation (for fundamental change) might be different. But it isn't in the future – it's in the recent past, and the present" (p. 190). Unless halted and remediated, the negative impacts and continuing legacies of

population growth, resource depletion and environmental degradation, when amplified into the future, present major challenges for children and future generations.

Urbanisation and Industrialisation

One such impact, itself is a driver of global change, is rapid urbanisation. In 1800, only 5% of the world population lived in cities. By 1900, the figure was around 15%. In 2000, this had jumped dramatically to around 50% of the world's six billion people being urban-dwellers. The most dramatic evidence of accelerating urbanisation is in the growth of very large cities, known as megacities, with populations of over ten million (United Nations Population Fund, 1999). This kind of urbanisation, with large numbers of people living in material-intensive metropolitan centres is a phenomenon that has occurred only in the past century. In 1900, there were about 16 cities with a population of a million or more and none over 10 million. In 2000, there were 400 cities over one million and the ten largest contain over 11 million people. China plans 22 cities of over a million each in the next decade (Suzuki, 1998). As McMichael (1993) comments "Rapid urbanisation represents a profound transformation of human ecology – a transformation that is generally outstripping social and political responses" (p. 261). The report of Population Action International (1997) reinforces these remarks, stating that the environmental by-products of large and concentrated urban populations pose direct threats to health and to the quality of city life. The report further stresses that "It is clear that many cities have reached the point where further population growth jeopardises the delivery of basis services to all" (para 3).

This effect is particularly so within poor or developing countries where the average growth rate for cities is 3.5% compared to 1.9% for these countries overall (Population Action International, 1997). The GEO 2000 Report also comments that these countries, generally with the least capacity to build physical and social infrastructure, profoundly feel the environmental and social impacts of urbanisation. Not only are they replicating the resource use patterns typical of the earlier phases of development in the industrialised world, but the environmental efficiency now being sought in industrialised countries is often seen as a luxury in these developing countries.

Simpson (1994) has also reported on problems associated with increasing urbanisation and expanding industrialisation. These problems include: increasing traffic leading to widespread problems in air and water pollution, occupational hazards, traffic trauma, psychological stress, waste disposal problems, and risks from chemical and industrial accidents. Rapid urbanisation also leads to limited access to services such as health and

education, inadequate and unsafe housing, poor diet and hygiene and inadequate protection from exposure to environmental contaminants. These issues arise because of the inability of governments to provide social, as well as physical, infrastructure. Social exploitation also tends to be exacerbated, especially for children, with serious problems associated with exploitative child labour. Sexual exploitation, the social "ills" of unemployment and a rise in "survival jobs" (Adams, 1996) – in organised crime, drug trafficking, armed bands and militia, prostitution, corruption rake-offs and swindles (United Nations, 2000) – also rise as poverty increases. Additionally, inadequate housing, family breakdown, substance abuse and crime also appear as outcomes of rapid urbanisation and poverty (Simpson, 1994).

Another aspect of urbanisation is that city living, even in the "greenest" cities, creates profound schisms between human beings and nature and leads humans to lose touch with, and respect for, their own connections with nature and natural systems (Nabhan & Trimble, 1994; Suzuki, 1999). This distancing from nature encourages humans to believe that they are no longer subject to the same requirements as other life forms, and no longer understanding of their dependence on the life support systems of Earth. As Orr (1999) states in his discussion about human separation from nature:

> Our sense of reality, once shaped by our complex sensory interplay with the seasons, sky, forest, wildlife, savanna, desert, river, sea and night sky, increasingly came to be shaped by technology and artful realities. Compulsive consumption, perhaps a form of grieving or perhaps evidence of boredom, is a response to the fact that we find ourselves exiles and strangers in a diminished world that we once called home. Natural elements are viewed simply as resources for human use with water, air and soil as regarded as sewers. The loss of other species is of little concern as their relevance to humans is not understood. (p. 141)

Cities are human-created habitats which are "radically diminished biologically" Suzuki (1998, p. 10). They have been shaped "by and for only one species" (Nabhan & Trimble, 1994 , p.II). A consequence is that opportunities for connecting with other species are often highly contrived and constrained – such as home gardening, keeping pets, visiting zoos and public gardens or "connecting with nature" when the Mobile Animal Nursery comes to visit the shopping centre, daycare centre or school (Nabhan & Trimble, 1994; Suzuki, 1997).

Social Inequalities and the Wealth Gap

Population growth, resource depletion and urbanisation are having severe impacts on the Earth's ecological systems. However, the social impacts of these drivers of change are equally profound. We are living in a world where 20% of the world's people are taking and using about 80% of all resources (Trainer, 1997) and where the world's richest 1% of people receive as much income as the poorest 57% (UNDP, 2002; United Nations

Department of Public Information, 2000). In addition, high-income countries import resources from poorer countries, fuelling further consumption by rich nations while limiting future opportunities for the use of these resources in the poorer countries. This exacerbates poverty in some areas and wasteful overproduction and over-consumption in others. Indicators reveal that the gap between rich and poor, within nations and across the globe, is increasing (UNEP, 2000) and that, among the 1.2 billion people in the world who struggle to survive on less that a dollar a day, 600 million of these are children (UNICEF, 2000).

In some parts of the world, often the poorest nations, serious armed conflict has exacerbated social and environmental problems. Loss of lives in war is accompanied by increased pressure on ecosystems. Resource productivity collapses in war-affected areas and there is a danger that environmental damage will affect much wider areas than those directly involved in the conflict, as was the case in the Second Gulf War and in recent conflicts in (the former) Yugoslavia, Rwanda and Afghanistan. Large numbers of refugees place social and environmental stresses on neighbouring countries and there is growing concern that environmental degradation and resource shortages may actually cause armed conflict. This is especially around environmental issues such as severe water shortages, widespread desertification, health-threatening toxic contamination and refugee flight from environmental wastelands (UNEP, 2000).

Addressing the gaps between rich and poor and understanding the links between the quality of the environment and social stability are, as Feachem (1999) writes, one of the greatest challenges of the new century. One way forward is for the merging of the principles of social justice with environmental responsibility. Low and Gleeson (1999) have developed two related concepts – environmental justice (which centres on the welfare of humans) and ecological justice (a broader perspective that encompasses the conservation of the integrity of the planet) – as a means to address these newly emerging issues of inequity.[22] These writers contend that this is a necessary step in developing a coalition between social justice and environmental movements as a means of ensuring that economically vulnerable communities (or nations) are not, or do not, continue to be made the repositories for environmentally damaging development. Feachem (1999) reiterates that "Failure to do so properly will have dire consequences for the global economy, for social order and justice, and for civilization as a whole" (p. 1).

[22] *The Earth Charter* is a recent statement of global ethics that synthesises social and environmental concerns, grouped around four categories: respect and care for the community of life; ecological integrity; social and economic justice; democracy, non-violence and peace. See www.earthcharter.org/earthcharter/charter.htm

Even in the most affluent nations, where one would expect the benefits of economic development to lead to happy and untroubled lives, there are growing signs of social disharmony, dislocation and breakdown. “Even the children of the affluent often live in intellectual and emotional poverty, leading fragmented lives” states Adams (1996, p.13). Rises in rates of suicide, increases in substance abuse, feelings of disempowerment and purposelessness about the present and the future are symptomatic of this discontent (Hutchinson, 1995). Affluence has not necessarily led to strong social support networks in families or communities or to the development of individuals who are resilient in the face of widespread and rapid change. Ultimately, the pervasive effects of global environmental changes are unavoidable, even for the wealthy and their children.

Economics, Science and Technology

The global dominance of a single notion of economics based on market forces, where increasing consumption of goods and services is needed to continually fuel economic growth, is one of the key factors said to lie at the heart of these environmental and social crises (Eckersley, 1998; Harris, 2002; Lowe, 1996; UNESCO, 1997).[23] Underpinning this view of development and progress is the belief that there are no limits to growth, an idea strongly rejected by many writers and commentators (Ellwood, 1996; McMichael, 1993; Orr, 1994; Trainer, 1997). Suzuki (1999) says that governments and corporations are “monoculturalising” the planet with this single notion of progress and development. Less flattering is the comment of Andrews (1996) who claims that this system is one of “predatory economics”.

Central to these critiques of conventional economics is the inability of the market to adequately consider the negative social and environmental costs of economic development, many of which remain invisible or only partially accounted for. This is because the environment or society as a whole, rather than individual producers or users of goods or service, bears the cost and burden of coping with the problems (Stretton, 1999; UNESCO, 1997). The irony of current economic thinking is that the costs of cleaning up an oil spill, or of relocating and retraining workers who have lost jobs as a result of global economic restructuring, actually add to economic activity and increase measures of economic growth such as Gross Domestic Product.

[23] On a global scale, this is being played out under the banner of the World Trade Organisation, which seeks to eliminate trade barriers, such as a nation’s environmental protection legislation or the use of tariffs to protect vulnerable farmers and industries, seen as impediments to economic activity.

An anthropocentric notion of human capital underlies mainstream economics where goods and services only have value in relation to human needs and wants. Thus, damage to the natural environment is simply an "externality" in conventional economics while "natural" capital is significantly undervalued (Albert, 2002; Stretton, 1999). For example, a forest has economic value only when it is exploited for human needs and wants, such as by supplying wood or paper. The natural services it performs – filtering, purifying, stabilising, acting as a "carbon sink", contributing aesthetic values to human existence, providing habitat for non-human species, or homes, food and resources for Indigenous groups living outside mainstream economic systems – are only just beginning to be calculated.

The key to understanding and remedying this situation is to realise that an economy committed to affluence and growth is incompatible with ecological or social sustainability. We are "condemned to be affluent and wasteful" says Trainer (1985, p. 36), as within this dominant political and economic model lie a range of individual economic behaviours which "allows, indeed encourages, citizens to make the pursuit of their own interests, understood largely in terms of material wealth, the chief goal of their lives" (Singer, 1993, p.19). Trainer continues by stating that "we are trapped in an economic system that cannot tolerate any reduction in total sales and consumption without threatening devastating consequence" (p. 36-37). The high levels of resource use and waste are an inevitable structural characteristic of a social system which cannot be avoided without fundamental change to an alternative system.

Intricately connected with, and magnifying the effects of, mainstream economic development is the predominance of the "science and technology juggernaut". Indeed, the rise of the "new economy"– centred on the United States boom (and bust) in communications and internet-based technologies – appears to have shifted economic activity to new levels and into new forms, despite recent share market adjustments. These kinds of "virtual" production are reported to be creating a "new economic paradigm", an economic and technological transformation from an older industrial economy to an information economy that some believe to be permanent. However, this information economy, masks many endemic economic, social and environmental problems. It is important that "we get past the myths of science and technology – that science, and its associated technologies, is not benign" (University of Wollongong, 1995); and that there are economic, political, social, environmental and moral issues lying beneath the image of science and technology as neutral. As Schneider (1997) reinforces:

> It is a sad reflection on our societies that the biggest share of R & D budgets in many so-called advanced countries is spent on defence, and that many of the world's poorest countries squander money on buying imported high-tech weaponry rather than on primary schools and clinics. (p. 5)

Science and technology are inextricably linked with the paradigm of economic growth. However, Gordon (1993) points out that it can no longer be taken for granted that what was once good for modern science is necessarily good for the post-modern planet. Science is seen by a growing number of writers and researchers (Gordon, 1993; Gough, 1994; Schneider, 1997) as ill-equipped to decide the kinds on choices we have or the kinds of futures we want, either for ourselves or for our children and future generations. As with conventional economics thinking, mainstream scientific thought and application predominates in, and perpetuates, worldviews that diminish social and ecological considerations. Narrow conceptions of science, rather than holistic ones that recognise the importance of the social and environmental perspectives (Lowe, 1999; Union of Concerned Scientists, 1993), often fail to investigate the intersections of scientific inquiry with their human, environmental and ethical dimensions, which are too often ignored or trivialised. Indeed, for many environmental problems, the scientific and technical solutions are well known. Rather, it is the lack of personal, social and political will to change current ideas and practices that prevents solutions being enacted.

A further critique is that scientific inquiry is largely about specialisation, with reductionist scientific inquiry consuming huge amounts of time, energy and resources around the world. What scientists acquire after focusing on a part of nature, and reducing it to its most elementary components, is "a deep understanding of that fragment of nature" (p. 9) while the synergistic interactions of different components of nature ensures that what emerges from these interactions cannot be anticipated on the basis of the properties of the individual components (Suzuki, 1998 , p.9). This focus on parts, rather than wholes, strongly indicates the need for caution as the problems of the world do not fall neatly into the divisions of the conventional scientific disciplines and often cross the discipline boundaries to involve social and ethical dimensions (Lowe, 1999).

Summary

This section has highlighted the challenges ahead. Even amongst the materially well off, many young people's thoughts about the present and the future are rather gloomy (Hutchinson, 1995). However, for the poor and poverty stricken, malnourishment, sickness, even death are common features of daily reality (Lowe, 1996; McMichael, 2001a; United

Nations Department of Public Information, 2000). Increasingly, it is recognised that these are symptoms of economies and social structures built on an unsustainable model of economics that is combined with the dominance of science and technology (Eckersley, 1998; Shearman, 1999; Trainer, 1997). This has created a worldview characterised by its obsession with material and monetary growth, the subjugation of nature, the marginalisation of non-Western cultures, and the manipulation of vulnerable groups to meet the demands of the economy. This is a "defective worldview that is constantly creating the social world and progressively destroying the natural one" (Slaughter, 1996b, p. 677). This dated worldview is recognised as a major barrier to the transition to a post-materialist world that embraces Earth stewardship and the needs of future generations. As Raven (2002) states, "our ethics and values must change… to [make us] more on track to guaranteeing a decent future for our children on a healthier planet, in a more vibrant democracy, living in better neighbourhoods and communities" (para 7).

CHILDREN AND THE ENVIRONMENT

This section examines more closely the impacts on, and prospects for, children and future generations if this exploitative worldview is not challenged. An important task of society is to equip children with the attitudes, values, knowledge and skills for their future lives. In light of the challenges discussed above, it is imperative that this includes those attributes necessary to rethink and change existing patterns of thought and action so that securing healthy, just and sustainable futures for all becomes possible. As children's lives are already being colonised by exploitative, materialistic ideas and practices – they are targeted "economic units" of the market system just as much as their parents (Adams, 1996) – the implications for children and future generations of continuing with existing practices and lifestyles are obvious. As Stevenson (1993) comments:

> We have to lift our thinking beyond the short-term problems and be responsible for the long-term consequences of our actions. The future belongs to our children. We're really not doing the right thing by them in some of the decisions we're taking today. (p. 11)

As the previous section has indicated, high population levels, increasing urbanisation, industrialisation and technological development within the framework of growth economics are key drivers in creating global social and environmental change. Some believe there will be a stable, prosperous world in the future that "will be comfortable for our grandchildren to live in", and where there will be a permanent majority of people leading prosperous lives, because "the entire planet is turning middle class" (Rees-Mogg, 1999). However, while some effects of global economic and materialist expansion appear benign and even

worthy,[24] these mask many other underlying and entrenched social and environmental problems. Central amongst these, as already discussed, is the sacrificing of the social, economic and health needs of many to privilege a few in order to maintain and expand economic growth, which also ignores ecological limits to growth.

Addressing issues of social and environmental justice is very important says Wilson (1996) especially as there is growing concern that poor children are heavily, and often disproportionately, exposed to a multitude of environmental hazards, including, for example lead, industrial and automotive air pollution, effluents from toxic waste disposal sites, as well as an array of untested consumer chemicals of unknown toxicity (Landrigan & Carlson, 1995). There is also growing evidence of unequal distribution of exposures to toxic hazards amongst children of different racial, ethnic or socio-economic groups even in the United States (Wilson, 1996). This implies a combined negative impact of economic *and* environmental disadvantage on many of today's children.

However, equity *between* generations also needs to be considered when thinking about social justice, implying a broad notion of justice that embraces intergenerational equity (Low & Gleeson, 1999). These ideas are encapsulated in the following quotation by Timberlake and Thomas (1990):

> We borrow environmental capital from future generations with no intention or prospect of repaying. They may damn us for our spendthrift ways, but they can never collect our debt to them. We act as we do because we can get away with it: future generations do not vote; they have no political or financial power; they cannot challenge our decisions. But the results of the present profligacy are rapidly closing options for future generations. Most of today's decision-makers will be dead before the planet feels the heavier effects of acid precipitation, global warming, ozone depletion and species loss. Most of the young voters of today will still be alive. (p. 11)

Vanishing Habitats for Children in Cities

Children are increasingly enculturated into patterns of over-consumption and social and environmental exploitation through their day-to-day living in materialist economies and urban environments. They also have reducing opportunities to understand their "place in nature" because as McKibben (1990, p. 189) states "Nature is already ending, its passing quiet and accidental". Rivkin (1997) comments that the development of humans from a species in largely natural environments to a mostly indoor existence, is so recent that most adults in the United States still remember outdoor play as a significant and treasured part of

[24] Examples include rising living standards in some developing countries, the potential for greater democratisation via the internet, and rapid exchanges of information.

their childhoods. Urbanisation, industrialisation and information-based technologies, she says, have taken nature-based habitats away from children.

Over half of all people throughout the world now live in cities, with the majority of children alive today being city-dwellers. In developing countries, 57% of all children born in the 1990s have grown up in urban slums or metropolitan areas where natural habitats are severely impoverished. Even in materially rich counties like the United States or Australia, a quarter of children born in this generation will start their lives in slums, most never experiencing "the lands upon which their food is grown, let alone terrains dominated by species other than our own" (Nabhan & Trimble, 1994, p. 11). Children's contacts with other creatures most likely will be with the cats, dogs, cockroaches, caged birds, rats and mice that, as Nabhan and Trimble (1994) continue, have had "much of the wilderness drained out of them as they have adapted to human habitations" (p. 11). Children are growing up without nature as their measure because the environments they inhabit are largely of human design (Jacobs, 2001; Nabhan & Trimble, 1994; Rivkin, 1995).

For example, a major element is the design of cities for cars. At the same time as natural spaces in cities are reduced because of crowding associated with urbanisation, urban dependency on automobiles also severely limits children's capacity to experience outdoor environments (Rivkin, 1997). Cars and other vehicles dominate the outdoors with 40% of urban environments given over to cars – as roads and freeways, parking spaces, garages, car sales yards and so on (Newman & Kenworthy, 1999). Much of the remaining places for outdoor exploration in cities and suburbs have become or are perceived to be dangerous, have already disappeared, or are fast vanishing (Jacobs, 2001; Rivkin, 1995). Parents are increasingly fearful of their children playing in local parks, creeks and bushland, concerned that children will be playing amongst "the detritus of our times" – broken glass, discarded syringes, old tyres and endless plastic and cardboard packaging. Rossmanith (1997) comments that these fears lie in the reality that "it is our increasingly privatised lives that have exaggerated the sense of danger of the world outside" (p. 175).

As a response to these urban fears about the safety of many city spaces, children are increasingly offered indoor, sedentary recreational alternatives (television, video and computer games, the internet) or are enrolled in outdoor play that is highly organised and supervised (such as competitive sports). Increasingly, another alternative is the mainly indoor "pay-to-play" entertainment centre where entry depends on family finances and where exploration and play is also highly mediated. Unfortunately, the reality is that many

city spaces *are* riskier than previously, as deteriorated social conditions such as homelessness, crime, substance abuse and guns[25] make being outside a concerning play alternative (Rivkin, 1997).

City design and urban stress are not the only factors that limit children's opportunities for outdoor play and other neighbourhood experiences. Other social changes have also impacted on the opportunities for children to spend time outdoors. A generation ago, children came home from school and played in local parks, creeks and backyards until dark. Now, however, lengthening regimens of day care, school and after-school activities combine with longer work schedules of many parents to limit children's opportunities to play outdoors (Rivkin, 1995). Backyards have also undergone major transformations over the past decades. Rather than rough terrain and "wild" patches, or even garden beds and fruit trees, many backyards have been transformed into outdoor living/entertainment areas – often centred around the barbecue – where adult needs and wants prevail, even though children are the most likely users of these spaces on a regular basis.

Additionally, the weekend, once an opportunity for children to play relatively unsupervised with friends and family is increasingly organised to the same busy schedules as weekdays, with children's sports, dance and music lessons timetabled alongside parents' household chores and/or "flexible" work demands. For many children, not even school holidays provide "time out" for play and exploration. Many children attend supervised vacation programs while their parents are working and these too, are generally based around supervised indoor activities. As Rossmanith (1997) comments "Many children are on the treadmill once reserved for workaholics" (p. 63). Collectively, these changed social conditions have led to significant reductions in children's opportunities for exploring "wild places", neighbourhoods and backyards, even if these spaces were still to be found. This underscores the importance of making the most of what opportunities remain for children to have meaningful experiences with nature, limited though they may be. As Strode-Penny (1996) comments, there is a need for "new environmental narratives for children that support intractable involvement or kinship between social, physical, personal, and natural environments" (p. 54). This is important because as Dighe (1993) emphasises, "One can hardly imagine a generation of persons with neither interest in nor knowledge of the outdoors making responsible decisions regarding the environment" (p. 62).

[25] The author is from the United States and her comments reflect aspects of society in that country.

Outdoor Play and Learning for Children

Maximising opportunities for outdoor play and learning and experiencing and exploring the world of nature help provide children with awareness of the interrelationships that exist among all living things. As Wilson (2000) states, outdoor play helps overcome the belief that we humans are "separate from" rather than "a part of" the world of nature. Even so, personal, family, societal and environmental changes have reduced children's capacities to experience nature in positive ways, for lengthy periods. This means that such opportunities need to be created for children, particularly for those growing up in cities. Children need places where they can explore and get dirty, touch living plants, care for and learn about insects, fish, birds, worms and spiders, in order for there to be growth of environmental awareness and responsiveness (Nabhan & Trimble, 1994; Wilson, 1994). These authors also argue for places where children can meet, make friends and interact, and that, in the absence of truly "wild" places, the greatest possible use needs to be made of playgrounds, parks, schoolyards, and other available open spaces. At the same time, there also needs to be strong public advocacy for expanding existing opportunities for children's play, such as redesigning urban areas where traffic is "calmed", reduced or excluded; protecting and enhancing green spaces that are safe and accessible; perhaps converting some of the orderly "Victorian era" parks and gardens into habitats that are more biologically diverse and interesting for children (Hough, 1995; Rivkin, 1998). The creation of safe and inclusive communities where children – and adults – can have quality opportunities to relate socially and environmentally should to be priorities for citizens and governments (Wilson, 1996).

It is not enough to expect, however, that simply having experiences with nature will be sufficient for children to develop empathy and caring for the natural environment or lead to thinking and practices that support ecological sustainability. Contact with nature alone is not sufficient. Ways need to be found for children to observe, imitate, talk with, and walk alongside adults who actively demonstrate knowledge of, and respect and caring for, the environment (Basile & White, 2000; Elliott, 2002; Hart, 1997; Jacobs, 2001). Central to this support is someone who will "show an interest in [children's] experiences and discoveries, someone who will demonstrate a respect for the natural environment, and someone who will encourage close observation of the world around us" (Wilson, 1995 , p. 49). This is an interactive social process, with teachers acting as active researchers *with* children, in a dynamic exploration of the world (White, 1998). In all settings inhabited by children, curriculum decisionmaking that recommits to children's outdoor play and learning

in “natural” settings, in the company of adults who are informed and caring about the natural world, needs to be a priority (Hart, 1997; Rivkin, 1995).

Significant evidence indicates that children respond to, and want to learn about, and care for their social and natural worlds, firstly in their own familiar “habitats”, then later, more broadly (Gordon Community Children's Centre, 1993; Wilson, 1996). In the company of environmentally-sensitive and child-responsive adults in homes, daycare centres, kindergartens, preschools and schools, some young children are learning practices of sustainability through creating and maintaining gardens, composting, adopting water minimisation routines, planting trees and bushes and protecting animal homes (Wellisch, 1995; Wilson, 1996). These outdoor practices in conservation are also extended to include energy efficiency practices, waste recycling and waste reduction inside classrooms, as children learn to become resource conservers as well as resource consumers.

Research has yet to show how childhood experiences develop environmental values. Nevertheless, there are growing indications that such values are rooted in childhood environmental experiences (Rivkin, 1997) with groundings also being set for children to learn to become “environmental activists” later in life as a result of their early experiences. Hart (1997), for example, describes numerous case studies of children planning and participating in environmental action research projects in local schoolgrounds and communities, as well as linking into international environmental projects. A study by Chawla (1998) of adult environmental activists identified significant childhood environmental experiences as precursors to their adult environmental activism. Thus, such early environmental experiences may indeed have potent later impacts. It would seem that even very young children, supported by parents, teachers and carers, do begin to “make a difference” (Gordon Community Children's Centre, 1993) and that this kind of learning is being carried through into later life.[26]

CREATING FUNDAMENTAL CHANGE

How teachers might begin to address the pressing and seemingly overwhelming challenges discussed in this chapter is the focus of this section. Numerous writers (Harris, 2002; Lowe, 1998a; McMichael, 2001b; Sterling, 2001; UNESCO, 1997) comment that alternative ways of thinking, living, and educating are needed in order to break from “the industrial fantasy”

[26] There is ongoing debate about “significant life experiences” (SLE) and their contributions to environmental activism. Chawla, and even her critics, however, claim the relevance of such research, and support continued research into SLE (see Vol. 5 (4) and Vol. *7* (4) of *Environmental Education Research*).

(Slaughter, 1996, p. 677) of the past and present, and that "reconnect us to each other and with the earth" (p. 677). As Lowe (1995) states:

> The future of the human species is critically bound up with the recognition that we are part of a complex ecosystem…Our destiny is inextricably intertwined with the overall health of that ecosystem. This earth is the only home we have and the only home we are ever likely to have. There is no prospect of rescue by friendly aliens or mass migration to another part of the cosmos. The future of our nation and the entire human species is something we are in the act of creating. Shaping a satisfactory future depends critically on our recognition of the ecological realities of life on this planet. (p. 10)

Lowe (1995) also states that "the highest priority" for society is to identify strategies for moving towards sustainability, by re-examining practices which have served well in the past, but which are now in conflict with the goal of sustainability. It is imperative, even though there is a sense of urgency to make progress quickly before "time runs out" (UNESCO, 1997), that these strategies include social processes that develop "social foresight capacity" (Slaughter, 1996a) where long-term thinking becomes the social norm. Connections and reconnections between humans and nature, and between humans and humans are integral. In particular, this means giving voice to those who have little voice within existing structures and processes, such as Indigenous peoples, non-Western groups and the poor. It also includes children, and those with no voice at all – future generations (Inayatullah, 1998).

THE GOAL OF LIVING SUSTAINABLY

Slaughter (1996) states that the goal of futures study "is to help us make the transition from one type of culture to another, while there is still time to do so" (p. 667). This goal is named by some environmentalists as "sustainable development". Others refer to "sustainability" or "sustainable living". These are not fixed notions but evolving concepts and emerging visions (Fien, 2001a; UNESCO, 1997) and have been variously defined and described. One broad definition that has wide usage defines sustainability in terms of the present and the future. This definition states that "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 8). While open to multiple interpretations, this definition recognises that sustainability cannot be easily grafted onto existing economic practices. It requires learning how to live and produce in dramatically different ways (Labonte, 1993).

A consistent feature of definitions of sustainability, however, is recognition of both human and ecological aspects of development. UNESCO (1997), for example, reports that:

> [It] is a process which requires that the use of environments and resources by one group of people does not jeopardise the environments and well-being of people in other parts of the world or destroy the capacities of future generations to satisfy their reasonable needs and wants. (p. 13)

As with the WCED definition, the above definition also includes notions of intra- and intergenerational equity, as well as conservation, and implies a strong ethical base. It is underpinned by a belief that sustainability is "fundamentally concerned with culture" and responds to an imperative "to imagine a new basis for relationships amongst peoples and with the habitat that sustains human life" (UNESCO, 1997, p. 14). These ideas are expanded upon in the following minimum four conditions for sustainability suggested by Lowe (1994, p. vii):

(1) There must not be unreasonable depletion of any resource;

(2) There must not be significant damage to the eco-system;

(3) There must be no significant decline in social stability;

(4) The sustainability of other societies must not be harmed.

Such conditions require major shifts in core values and the ways in which people live – in short, deep-seated cultural change is necessary. Brown (1981) emphasised the need for such a transformation, arguing that the creation of a sustainable society requires fundamental economic and social changes. He also asserts that of the many dimensions of the transition to sustainability, "the most critical is time" (p. 8). Since the 1980s, writers have not diminished the urgency and need for fundamental change. As UNESCO (1997) states, sustainability calls for a dynamic balance amongst many factors, including the social, cultural and economic requirements of humankind and the imperative to safeguard the natural environment. McMichael and Hales (1997) also emphasise the need for broad ranging change, commenting that sustainability requires "radical reforms of our core values, and social decision-making processes. Governments, private enterprise, non-government organisations, communities and economists: we're all in this together" (p. 428). While there is little agreement about what these changes might look like, Henderson (1993) delineated a number of attributes and principles she considered were necessary for sustainability. These include increased appreciation of the biological and life sciences as a basis for understanding the world, and a move away from static, equilibrium or mechanistic scientific models. Thus, she claims that the principles of interconnectedness, redistribution, networks, complementarity, uncertainty and change should prevail, and it is apparent that these kinds of attributes continue to underpin thinking about sustainable development.

EDUCATION: A CATALYST FOR CHANGE

The challenge of moving to sustainable patterns of living cannot be understated. The ecological and social crises outlined earlier in this chapter suggest that a paradigmatic break with the "industrial" models of the past – that continue into the present – is urgently needed for sustainability to be achieved. Whilst this might seem an unlikely hope, there are reasons for some optimism that changes can and will occur.[27] The environmental movement and a range of other social and educational movements have gathered momentum over the past thirty years. These include the civil rights movement, the women's movement, the peace movement and the movement for gay and lesbian rights, each aiming to "bring about change using different ideas about what is a desirable society" (Furze & Healy, 1997, p. 25). As Stanley and Benne (1995) have written in their discussion about the role of education for social reconstruction, "All of these movements are trying to reorient public opinion by re-educational [sic] protests and programs against injustices and other threats engendered by our functionally rationalized and profit-driven political economy" (p. 156). These authors also contend that it is the ecological movement that is the most promising in spearheading a coalition around the globe. This is because, regardless of the importance of each movement's commitment to its single social justice issue, "survival of the human species can come to be accepted as a good for all people if they hear and accept the message that their own collective and personal conduct is now contributing to species suicide" (Stanley & Benne, 1995, p. 25).

Many believe that education holds the key to altering the environmentally damaging patterns of the past and present, and that it is critically important in helping to make the break with unsustainable models of development (Lowe, 1998a; UNESCO, 1997). While not the complete answer, education "must be a vital part of all efforts to imagine and create new relations among people and to foster greater respect for the needs of the environment" (UNESCO, 1997, p. 15). However, mainstream education has developed within the framework of the dominant industrial worldview and, therefore, acts to reinforce this worldview. As a consequence, education contributes to creating and reinforcing short-term, exploitative cultural ideas and practices that are unsustainable (Fien & Trainer, 1993; Slaughter, 1999; Sterling, 2001; Stevenson, 1987).

[27] Demonstrations in Seattle and Davos against World Trade Organisation meetings are examples of growing concern and dissatisfaction with global policies that promote free trade, lower prices and market efficiency while seeming to discount human and environmental costs of economic development (Albert, 2002).

Education is not a static enterprise, however. Reform processes in education in recent times have particularly focused on the restructuring of education in parallel with economic "structural adjustment" (Sterling, 2001). However, from a sustainability point of view, Sterling argues that the problem with the current culture of change is that it is first order change,[28] and is made for the wrong reasons (p. 43). Sterling emphasises that the round of managerialist (economic rationalist) reforms currently taking place are about adapting educational policy to what is predicted to be the demands of a globalised economy. In other words, education is being redesigned to help people adapt to change, rather than to develop their capacity to shape change.

It is the latter that is needed if education is to be reoriented for sustainability. Fundamental educational reforms that challenge existing goals, structures and roles for schools, teachers and students are required (Fien, 1999). As Orr (1992) has stated "the crisis [of sustainability] cannot be solved by the same kind of education that helped create the problems" (p. 83). The agenda for education in current economic rationalist reform is an adaptive one towards greater economic effectiveness and efficiency, argues Sterling, while sustainability requires "create/critique" education to help human systems work with and within Earth's ecological systems (Clark cited in Sterling, 2001). This is a very different orientation that stresses community, capacity building and creativity rather than control, fit and dependence (Sterling, 2001).

Education needs to be both transformed (education *in* change) and transformative (education *for* change) in order to have a significant role in the transition to sustainability (Sterling, 2001). Achieving both will require re-education of politicians, bureaucrats, business and communities, as much as it will of teachers and children because of the scale and complexity of the issues to be addressed. Indeed, education for sustainability needs to be a lifelong educative process, not simply a process for formal education. Education in the broadest sense – within families, early childhood and community education, schools and tertiary education, workplaces, the media and governments of all levels – has an important role in all settings and in all life phases in educating people for sustainability (UNEP, 2000; UNESCO, 1997). Nevertheless, school education is both compulsory and accessible to the majority of children and has a very powerful place in this process. However, embedding sustainability principles into schools, as has been urged, involves much more than

[28] A criticism of 1st order change is that it seeks to improve the effectiveness without disturbing the basic organisational or instructional milieu of education. 2nd order change demands fundamental reform.

amending existing programs and practices. Education for sustainability challenges the "status quo" of schooling and implies fundamental reform and innovation.

Education in Change

Education is required to change significantly if it is to counter the hegemonic views and practices that contribute to unjust and unsustainable societies. Learning to cope with change and to shape change should be a central principle of education if sustainability is to be achieved. This means that a focus on integrated, interdisciplinary, indeed, transdisciplinary approaches to education (Fien, 1999; Tilbury, 1995; UNESCO, 1997) is needed that helps young learners become resilient individuals who are able to critically reflect upon and act knowledgeably, responsibly and creatively in a world of change. Unfortunately, within mainstream schooling there continues to be a major absence of educational approaches and practices that overtly foreground such transformative principles.

Nevertheless, discontent with current educational practices and systems has been mounting as education is perceived as failing to meet the needs and challenges of both individuals and society, in the present and for the future – and it is not just those with environmental concerns who are at the forefront of these criticisms. Fullan (1999), a leading writer and researcher in educational and school change, attests to growing dissatisfaction around the world with the performance of schools. An associated belief, he states, is that education, especially in knowledge-based societies, must also become an agent for societal improvement. Indeed, proponents of educational reform, including "progressive" educationalist John Dewey, proposed radical changes to education for such purposes nearly a hundred years ago. Researchers and reformers such as Fullan (1999), Hargreaves (1997c), and Tyack and Cuban (1995) continue to emphasise the need for radical change in schooling and education because of the recurring operation of relatively static educational models and practices built on "industrial" or "factory" design. However, very recent reform approaches, especially those deriving from the application of chaos theory[29] (Fullan, 1999; Gunter, 1997; Larson, 1999), suggest that educational change is more likely to be evolutionary rather than revolutionary in nature.

A common critique of these industrial educational models is that they are heavily oriented towards teacher-determined tasks and behaviours – focused on individual learners – rather than centred on collaborative learning within a classroom "culture". Posch and Rauch

[29] The application of chaos theory to educational change is explored in detail in chapter 6.

(1998) build on this criticism and have developed a comprehensive set of characteristics to further demonstrate the predominantly static nature of schooling. In relation to knowledge, their characteristics include: systematically structured knowledge that foregrounds well-established facts and de-emphasises open and controversial areas of knowledge; the definition, simplification and underrating of complex problems and personal experiences; and specialisation that encourages the maintenance of knowledge in "disciplines". In terms of teaching and learning, Posch and Rauch (1998) state that industrial models treat teaching as transmission of knowledge; this discourages the learner from generating knowledge, and from fostering creative and organisational achievement and reflective approaches to knowledge. Furthermore, they claim that the predominance of top-down communication approaches common in schools facilitates stable, low-risk teaching that discourages self-control, cooperation and the assumption of responsibility by students.

Overall, these kinds of criticisms imply that current approaches to curriculum development discourage students from developing as risk-takers, a trait considered necessary in times of change and instability. Posch and Rauch (1998) also contend that current approaches promote individualism rather than collegiality, a necessary attribute for understanding and overcoming complex problems; and that schooling relies too heavily on the security of factual knowledge rather than the ambiguities of multiple ways of knowing. As a consequence of such limitations, Sterling (2001) suggests that widespread transformation of existing educational policies, rationale, theory and practices needs to occur where studying and creating change is an essential component. This is necessary, he says, in order to give students the knowledge, skills, strategies and values to equip them for futures that will be even more uncertain, unstable and changing than is evident today.

As critique of current educational practice grows, some common understandings of characteristics that might be attributed to transformative education are also beginning to emerge. These have been translated by a number of reforming/transforming educational movements and, while not all of these have sustainability as a core principle, they parallel those proposed for education for sustainability. There is also some evidence of growing convergence between such educational movements (Clover, Follen, & Hall, 1998) as appears to be the case with some "critical" forms of environmental education, health education, adult and popular education, and futures education. Each of these transformative educations has its own successes and lessons that may be of value to the others, as well as to the broader movements for educational reform. This next section examines these emerging ideas around the concept of transformative education.

Education for Change: "Learning to Lay Down the Path Walking"

The previous section indicates that many current educational ideas and practices militate against social change. Indeed, they reinforce the status quo and contribute to the maintenance of ideas and practices that are unjust and unsustainable. Social and educational theorists also conclude that education has the potential to play a transforming role in leading society towards social and ecological sustainability.

While no one is entirely sure what sustainable societies will be like, there is growing agreement about the general characteristics of transformative education should be in order to aid the transition towards sustainability. Although open to further clarification and refinement, these characteristics have not changed significantly as the years pass. As Mische (1986) commented:

> We are in a vulnerable period. There is no guarantee that we will make a successful transformation to a more human world order. Now, more than ever, we need a relevant, creative education, an educational vision commensurate to the new needs of our times. We need to help our students develop the vision and pragmatic skills to be people of the breakthrough. We need educators who are not afraid to take on the critical problems life is putting before us; educators who do not succumb to despair or apathy, but have the courage to seek alternative directions. (p. 39)

Bawden (1999) deals with the dilemma of not really knowing what the changes might be, or how they might be enacted, by reference to the phrase "learning to lay down the path walking".[30] This expression implies that we have little choice but to proceed with change even though the processes are uncertain, and the goals are unclear. This applies just as much to education as to other aspects of society in need of change.

Transformative Education

A key principle for transformative education is the necessity to assist learners to cope with and lead rapid change (Lowe, 1998b). McMeniman (1999) reinforces this notion, commenting that education must be concerned about the knowledge and skills that can be adapted and transferred to new situations in preparing students for continuing and unpredictable change. Expanding upon this remark, McMeniman (1999) comments that new mindsets and new ways to think and act beyond existing ways of doing things are needed. Above all, she writes, "we need to ensure we do not visit our own time-locked conceptualisations on students and thereby inhibit their developing new ways of knowing and doing" (p. 2). Other characteristics that she highlights for transformative education

[30] Bawden comments that this phrase refers to a process of finding one's way by creating a new path – a traditional African version of "learning by doing".

include reflection and critical insight, and imagination. Of the former, McMeniman emphasises the importance of the quest for knowledge and creative solutions embedded in questioning insight, especially of students' own thinking. The latter, she says, involves the capacity to think of alternatives that are visionary, have a moral base, and display understanding of how other people feel, think and understand the world – a notion similar to "emotional intelligence", as articulated by Goleman (1995).

Hicks (1991) also proposes a set of morally-based characteristics for transformative education. These emphasise student motivation; ways for students to anticipate change; critical thinking; values clarification; decision-making; creative imagination; visions of a better world; responsible citizenship; and stewardship. As Slaughter (1999) notes, these kinds of characteristics seek to "reinvent schools on a new philosophical and operational basis" (p. 18), not overwhelmed by economic rationalism and "cyberspace", but which pursue the public good in the long view.

Transformative principles of education have been articulated not only in relation to mainstream schooling but also in adult education (Clover et al., 1998). These include: the socio-political analysis of human oppression over people and nature; "earth literacy"; critical examination of root causes of the environmental crisis and linkage between environmental and social issues; learning that makes links between local and global issues; and understanding of the interconnectedness of life and where humans fit into the web. In addition, these authors emphasise: experiential learning; learning that begins with people's experiences and draws on their potential as problem-solvers and change agents; critical reflection and evaluation; learning that promotes concrete actions, particularly collective ones; the development of learners' communities through utilising the community as a site for learning; and learning that draws out the creativity of all participants (p. 17).

Collectively, all these writers appeal for a very different kind of education to that currently offered to most young people in schools. It is an education that values knowledge and knowledge construction around topics and issues; is contextualised so that it is meaningful to learners; develops the capacities for critical, creative and futures-oriented thinking; and encourages participation and the capacity to act for community and societal improvement – a close match for the four pillars of learning – learning to know, to do, to live together and to be (as articulated in the UNESCO Delors Report (1996). Finally, as Wink (1997) states:

> The purpose of transformative education is to create processes whereby students can see that their actions do count. They are encouraged to take the learning from the classroom and to engage locally and socially [and environmentally]. This model of learning assumes that the generation of knowledge in the classroom leads to the betterment of life for the student or for the community. (p. 143)

Transformative Educators

Transformative education requires teachers with the courage to guide and promote processes of change (Mische, 1986). This is clearly a complex task that needs to involve more than professionally educated teachers working in formal schooling. It necessitates a broad community of educators from all contexts: parents, early childhood educators, primary and secondary teachers, tertiary educators, curriculum developers, administrators and support staff, workplace trainers, rangers, environmental health and planning officers, education officers in non-government organisations, community educators, youth leaders, parent association members and media personnel. This community of educators should include everyone, whatever their role in society, who perceive a need or duty to inform and educate people (UNESCO, 1997).

Not only does transformative education mean broadening the base of educators, it also means a radical reshaping of how teachers, especially those in schools, think and work. Central to this reshaping is a fundamental shift in the nature of teacher-student relationships. McMeniman (1999) comments that a key characteristic of teachers as transforming intellectuals is that they have shifted the locus of learning from the teacher to the student, and that teachers and students come together as co-learners. Giving primacy to learning – "the treasure within" (UNESCO, 1996) – which is facilitated, rather than dictated, by a teacher, leads to a suite of concomitant changes in teacher decision-making and pedagogy (Education Queensland, 2001). This includes, for example, teachers striving for improvements in student motivation and satisfaction through understanding about learning; expanded student choices about content; greater autonomy and self-determination in learning (McMeniman, 1999); the promotion of intellectual quality; pedagogical practice that promotes supportive social environments and recognises difference (Education Queensland, 2001); and better links between schools and communities. Central to a student-centred pedagogy is an increased emphasis on process, and enquiry- and issues-based approaches to teaching and learning (Fien, 2001a; Lowe, 1998a). In these approaches, processes are fostered that enable students to practice critical and creative thinking, "problem-reframing" (Sterling, 2001, p.38) and problem solving, decision-making, action taking, reflection and communication (Marsh, 2001).

Such shifts also mean that education becomes an overtly "political" endeavour. As Giroux (1985, p. 379) comments, teachers need to make "the pedagogical more political and the political more pedagogical". This may be at a classroom level encouraging students' capabilities to resist hegemonic myths and meanings that dominate society; at a school level through engaging in debate and acting on issues such as corporate sponsorship of schools; as well as becoming more outspoken in matters of public or political debate about education. To make these shifts, Mische (1986) states that "We require educators who are not afraid to take on the critical problems life is putting before us; educators who do not succumb to despair or apathy, but have the courage to seek alternative directions" (p. 39).

Transformational Learners

Transformative education also focuses on learners who can think and act effectively in uncertain and changing times. While it is impossible to clearly depict what students working within transformative educational frameworks, will be like, a number of writers have attempted to explicate their qualities or attributes. Slaughter (1994) for example, emphasises that students – if they are to live in, cope with and create qualitatively different futures in a rapidly changing world – will need their education to assist in the development of the following attributes: self-knowledge; cognitive and ethical frameworks; practical and artistic skill; contextual insights; foresight and vision; informed optimism and empowerment; and being part of a larger whole (Slaughter, 1994, p. 41). To these features can be added those suggested by other writers and researchers with an interest in the area of transformational education. Thus transformational learners should:

- Be motivated, curious and inspired (Bawden, 2001; Hicks, 1991; Lowe, 1998a);
- Learn to learn about learning (McMeniman, 1999);
- Anticipate change and learn to handle change (Hicks, 1991);
- Have creative imagination (Hicks, 1991; Lowe, 1998b) (McMeniman, 1999);
- Be critical, reflective and constructive thinkers (de Bono, 1999; Hicks, 1991; McMeniman, 1999);
- Become decision-makers and problem-solvers (Hicks, 1991; Lowe, 1998b);
- Have contextual insight, foresight, vision and skills of social innovation (Hicks, 1991; McMeniman, 1999).

Whatever the complete list of characteristics of transformational learners might be, it is obvious that our current systems of school education inadequately develop such learner attributes although some curriculum "experimentation" is beginning to emerge.[31] Even a cursory knowledge of mainstream educational practice leads the observer to recognise that what is currently offered in most schools is far from being transformational education. As McMeniman (1999) comments, engaging with the educational vision "is not yet delivering the goods" and what educational change is happening is "closer to relabelling an already familiar world rather than unlocking other worlds" (p. 10). Cynics might suggest that current offerings are still quite "pre-modern", let alone modern or postmodern.

Yet with the social, environmental, economic, cultural and technological challenges that are confronting new and older generations alike, it is increasingly recognised that the need for the development of such transformative characteristics in learners is fast becoming an imperative rather than a choice. Those in schools now are the very people who will be living in the midst of the "tsunamis of change" (Dator, 1998) that are to come. Education systems, schools, teachers and students alike need better outlooks, frameworks, networks, options and strategies if they are to equip young people to successfully ride the changes and shape socially just and sustainable futures.

[31] A recent educational innovation, referred to as "New Basics", on trial in some Queensland state schools, promotes learning outcomes as a series of "rich tasks" which offer opportunities for intellectually engaging, futures-oriented, enquiry-based, student-centred, multidisciplinary learning for students. For further information go to: http://education.qld.gov.au/corporate/newbasics/).

Chapter 3: Creating the Research Journey

INTRODUCTION

In the previous chapter, I outlined the "critical concern" that provided the rationale for this study. This concern highlights the need for a change to sustainable ways of living with emphasis on an enhanced role for education to be part of the change process. This concern also made the exploration and development of a research orientation with educational change as an outcome, an integral aspect of the study (see Figure 1.1).

This chapter outlines the framework or "quest orientation" (Dudley, 1982) of this study which, at its end appeared quite clear and well defined, was not always the case. The first year of the research journey, in particular, was a time of "wandering". There was a lack of direction and considerable uncertainty about the best ways to proceed. As stated in chapter 1, I began this doctoral research simultaneously with the school project upon which it was based I was in the school beginning the project, at the same time as I was trying to establish the best approach for both the project and the thesis process. Fortunately, my previous background and experiences with critical environmental education and critical research[32] approaches meant that I was not totally aimless during this time.

In this research design chapter, I describe the beliefs, purposes and principles that guided the study. These proved to be much more complex than portrayed in the research literature due to the realities of conducting participatory research in a busy school with its multiple agendas, processes and personalities. Nevertheless, this literature did provide a "mental map" or a theoretical justification that helped in making choices about ways to gather data, and to interpret and present the many mundane episodes and incidents, as well as the novel and serendipitous events that transpired during the research process.

This chapter also describes the conduct of the research. It discusses the considerations, issues and dilemmas I confronted as an action researcher, including the multiple roles of the action researcher, the "academic" as researcher in a school, and the complexities concerned with collaborative research processes, insider/outsider relationships and issues of power and trust. It also considers the problematic aspects of research validity and rigour. In addition, this discussion outlines specific research techniques used in data gathering, recording and

[32] This refers to my Masters of Environmental Education thesis *Empowering the School Community for Change: An Evaluation of Participation in the Ashgrove Healthy School Environment Project* (Davis, 1994).

analysis, and explains the rationale behind the unconventional way in which this report has been conceived and presented.

Finally, the chapter outlines the research context, the study background and its evolution, as initially indicated in Chapter 1. This includes an overview of the school, a description of its locality and key characteristics – its social, geographic and environmental features – and an explanation of "learnscaping", a concept central to this curriculum development project. This is followed by an overview of the action research itself, explaining its evolution. This account, also presented diagrammatically, discusses the three research cycles of the project and distinguishes the main events and processes that developed within each cycle.

STUDY AIM AND OBJECTIVES

As raised initially in the overview of this research in chapter 1, at the broadest of levels, this study has provided a means for the creation and re-creation of my own "living educational theory"[33] about teachers, schools, environmental education, and educational change and innovation. This has been an essentially personal intellectual journey leading to significant changes in my own educational theories and practices.

This private purpose, however, has been possible only through a more overt, practical aim that has sought to address issues of theory and practice in environmental education. From this aim, a number of research objectives have been identified. These are:

1. To document the "story" of the development of an environmental education innovation.
2. To critique the processes and outcomes of the environmental education project.
3. To articulate the "lessons learnt" about curriculum change in schools.
4. To add to discussion and debate about collaborative research processes in schools.

Thus, this study necessitated use of contrasting, but complementary, research methods to achieve both these public and private research goals. It is the purpose of the following section to explain these methods and to outline the underpinning methodological approaches and influences.

[33] This refers to a process of individual action research typified by the work of Whitehead (1989) and Lomax (1994). It is discussed later in this chapter.

THE METHODOLOGICAL ORIENTATION

While the personal goal for this study emerged over time, deciding upon the "public" objectives at the start of the project was not a particularly difficult task. They arose from my "critical concern" about the state of the planet and my background and interests in "whole school" environmental education. However, determining a theoretical orientation to underpin *how* these objectives would be met was much more complex. Nevertheless, it was apparent that the study would fall into the "postpositivist" research domain.[34]

It also seemed that the study would readily fit within the broad boundaries of socially critical research because of the implied suggestions for empowering participants to transform their social practices and pedagogies (emancipatory praxis). As Lather (1991) comments, this kind of research is about "how to turn critical thought into emancipatory action" (p. xv). As the study progressed and as my knowledge of research methodology deepened, this classification became less certain.

As Figure 3.1 shows, critical research contrasts with interpretative research orientations or paradigms. These categories, originally identified by Habermas[35] and characterised here by Smith (1990) cite the following qualities as distinctive:

- Positivist methods seek causal explanations;
- Interpretative methods seek explanations in reasoning; and
- Critical methods seek explanations of distortions.[36] (p. 189)

Lather subsequently added a fourth dimension that expanded upon the three Habermasian categories, to take account of the emergence of research orientations such as postmodernism, which "deconstruct" or "interrupt relations of dominance and subordination" (1991, p. xvii). Figure 3.1 illustrates how these differing research paradigms are aligned and contrasted.[37]

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[34] This is also referred to as "qualitative" research. According to Lather (1991), postpositivist research describes research that rejects positivist, or predictive, principles.

[35] Habermas (1971) identified three categories of human interest that underscore knowledge claims: prediction, understanding and emancipation.

[36] Distortions are evidenced by attempts to generalise research explanations from one context to all, viewing social and political problems as technical problems, and not recognising that knowledge serves to select interests and ideologies (Smith, 1990, p.189).

[37] Lincoln and Guba (2000) propose a fifth, "participatory/cooperative" paradigm, as suggested by Heron and Reason (1997). It is argued, however, that this category is simply an extension of existing emancipatory approaches rather than representing a whole new research paradigm, a view to which I am inclined.

Postpositivist Inquiry

Predict	**Understand**	**Emancipate**	**Deconstruct**
positivism	interpretative	critical	poststructural
	naturalistic	neo-Marxist	postmodern
	constructivist	feminist	post-paradigmatic diaspora
	phenomenological	praxis-oriented	
	hermeneutic	educative	
		Freirian participatory research	
		action research	

Figure 3.1. Four paradigms of social inquiry (Lather, 1991).

Thus, with regard to these classifications, this study appeared to fall easily into the emancipatory paradigm. This is because critical action research, which builds on the principles of problem solving, participant ownership and collaboration in order to lead to concrete action (praxis), was the main method selected to achieve the study objectives. In reality, though, this study reflects somewhat of a mixture of theoretical and methodological influences. While critical action research is the predominant research method, I have also used interpretivist methods, choosing narrative inquiry (McEwan & Egan, 1995) and case study literature (Stake, 1995) for "storytelling"/ interpretative aspects of the study. This latter body of literature was also invaluable for providing perspectives on the role of the researcher, developing understanding of ethical issues in research and ways of applying research techniques such as journaling, interviewing and document review. Furthermore, as the study proceeded, it became apparent that its "emergent" nature was also a key feature – the research becoming a reflexive process that also permitted critique of the construction of the method of investigation. Hence, there are also "construction/ deconstruction" features in this study showing the influence of postmodernist approaches on my developing research practice. Overall, a "patchwork" of methodological approaches has been utilised. Nevertheless, an emancipatory approach predominates because critical action research was selected as the primary research method for achieving the objectives of this study.

METHODOLOGICAL INFLUENCES AND CONTEMPORARY DEBATES

The reason action research was chosen as the principal research method for this study was because I wanted change as a research outcome. This aspiration derived from my critical concern about the state of the environment, and also because I had been influenced by discussions and debates that called for "alternative" ways of perceiving and conducting environmental education research that were different from the "applied science" view of inquiry that had dominated since its early years (Ashley, 2000; Robottom & Hart, 1993). These dialogues that circulated throughout the 1980s and 1990s, subsequently led to critical action research[38] being promoted as the preferred research approach for environmental education (Elliott, 1994; Robottom & Hart, 1993).

As Robottom and Hart (1993) commented at the time, confronting the social and societal nature of environmental challenges necessitates alternative ways of conducting research, and therefore research in environmental education "should be compatible with the ecophilosophical and educational worldviews which it seeks to support" (p. 44). This demand called for moves away from technical/empirical research approaches with their "cause and effect" reasoning, that are embedded into the scientific "old paradigm" (positivist) worldview of research. Robottom and Hart (1993) suggested that research more congruent with an environmental worldview was that which fostered the independent critical and creative thinking in relation to environmental issues, and which involved research participants in critical and creative thinking in relation to research action. A socially critical approach to environmental educational enquiry was put forward as meeting these goals, with action research proposed as a useful method. As I found (and continue to find) these arguments convincing, action research became my preferred method for this study. This method became even more appealing when a scan of environmental education research literature also revealed that very few environmental education researchers have actually taken up the challenge of conducting such research.

However, since I commenced this study (about six years ago), there has been fresh debate – basically a plea for acceptance of a wider variety of research forms and theoretical underpinnings – that have developed around issues of research in environmental education. In particular, postmodernist theorists and researchers (N. Gough, 2000; Payne, 1999) have challenged what they perceive to be a "hardline" approach to environmental education

[38] Critical environmental education research is discussed later in this chapter.

research. [39] These writers dismiss calls for action research to be considered, the "only appropriate form of environmental education research because it is uniquely consistent with an ecophilosophical worldview which, in turn, is uniquely appropriate to environmental education" (Gough & Reid, 2000, p. 6). Indeed, Hart (2000) has recognised that "we are now "between stories in educational research … when we realise that the new story will never enjoy the unity, the smoothness and the wholeness of the old story" (p. 44). Denzin and Lincoln (2000), expand on this theme in relation to research generally, commenting that research has been moving through a period of "moments", especially since the 1980s, that include blurred genres, experimental and new ethnographies and post-experimental inquiry. They consider that we are currently in a "seventh moment" that shows concern with moral discourse. This "asks that the social sciences and the humanities become sites for critical conversations about democracy, race, gender, class, nation-states, globalisation, freedom, and community" (p. 3).

Payne (1999) translates these fresh debates about research traditions in environmental education as contestation between the "reconstructive project of the modern and the deconstructive project of the postmodern" (p. 44). With postmodernism recognised as a cultural form as well as an era of history (Vidich & Lyman, 2000, p. 61), simplicity and straightforwardness in beliefs and practices are acknowledged as no longer applicable. Consequently, postmodernism challenges the theoretical underpinnings of critical theory, the research approaches built upon such theory, and the granting of "favoured status" to any one kind of research approach. This is not necessarily a rejection of action research for environmental education but rather an "opening up" of environmental education to a wider range of research possibilities.

Nevertheless, in acknowledging these recent research debates and their influence on my own work, my partiality towards emancipatory research remains. Indeed, it can be argued that critical theory, and the emancipatory approaches to research that arise from this theory, has already been changed by postmodern perspectives. Hence it is no longer the same "modernist" paradigm that it was. As Fals Borda (2001), one of the fathers of emancipatory action research, has recently written:

> To speak of liberation today in a post-modern world carries a somewhat different meaning from the political intent of previous revolutions…. But old ideals of personal and social advance and political insurgency still live…. A liberationist/emancipatory ethos is clearly

[39] See also Connell's critique of these same "hardline" attitudes towards empirical-analytical methodological research in environmental education (Connell, 1997).

> related to a new intellectual challenge: the construction of a practical and morally satisfying paradigm for the social sciences. (p. 31)

Thus, as Lincoln and Guba (2000) suggest, it is now acceptable to blend elements of one paradigm with those of others, especially where they share similar ethical elements or resonances. They suggest, for example, that elements of interpretivist, postmodern critical theory, constructivist and participative inquiry can fit comfortably together because, amongst other things, they share a common appreciation of the value-laden nature of research and the dilemmas that ensue for the researcher and the research process. Contemporary research is therefore more likely to involve the deployment of a wide range of interpretative/qualitative practices, aimed at understanding and "interrogating" the subject matter at hand, rather than presenting a highly organised and apparently methodical account of a research situation. Indeed, Denzin and Lincoln (2000) refer to the postmodern researcher more as a *bricoleur*, a maker of quilts or montage, a "Jack of all trades", a kind of professional do-it-yourself person. In this kind of research:

> The solution which is the result of the *bricoleur's* method is an [emergent] construction… if new tools or techniques have to be invented, or pieced together, then the researcher will do this. The choices as to which interpretative practices to employ are not necessarily set in advance. (p. 4)

Examples of montage or "quilt-making" are now beginning to appear in research texts. While the use of multiple voices, different textual formats and various typefaces,[40] at first glance, may appear as a "messy text", this should not be regarded as a typographical nightmare, even if it is non-linear. Instead, Lincoln and Guba (2000) state, these texts:

> …seek to break the binary between science and literature, to portray the contradiction and truth of human experience, to break the rules [to show] how real humans cope with both the eternal verities of human existence and the daily irritations and tragedies of living that existence. Postmodern representations search out and experiment with narratives that expand the range of understanding, voice, and the storied variations in human experience. (p. 184)

They also comment that the combination of multiple methodological practices, empirical materials, perspectives and observers in a single study can add rigour, breadth, complexity, richness and depth to an inquiry. The *bricoleur* becomes adept at performing a large number of diverse tasks, ranging from interviewing to intensive self-reflection and introspection. As Denzin and Lincoln (2000) note, "the researcher-as-*bricoleur*-theorist works within and between competing and overlapping perspectives" (p. 6).

[40] *Troubling the Angels: Women Living with HIV/AIDS* is an example of such a text (Lather et al., 1997).

These contemporary influences are apparent in this study as I have become more flexible than previously in relation to my own research theorising and practice, and acknowledge that "no specific method or practice can be privileged over any other" (Denzin & Lincoln, 2000, p. 6). The "patchwork" that has emerged in this study reveals the "emerging confluences" in contemporary research practice (Lincoln & Guba, 2000) and is more representative of the "post paradigmatic diaspora" that Atkinson et al. (cited in Lather, 1991) describe as exceeding and complicating Kuhnian paradigms. Overall, I agree with the comments of Atkinson et al.:

> Classifying research and researchers into neatly segregated "paradigms" or "traditions" does not reflect the untidy realities of real scholars…and may become an end in itself…. "Traditions" must be treated not as clearly defined, real entities but only as loose frameworks for dividing research. (p. 108)

In terms of environmental education research, release from strict methodological codes of belief and practice means embracing what Gough and Reid (2000) suggest as the acceptance of "multiple perspectives and limited ambitions" (p. 53). A claim that action research is the most appropriate form of environmental education research implies that an acceptable boundary for environmental education research has been drawn which forecloses further methodological debate. The danger is that environmental education research will become trapped in a time warp, leaving the field of environmental education absent from further theorising about research issues and removed from the revitalising challenges that emerge as paradigms shift and blend. Hopefully, this report will play a part in keeping these methodological debates alive.

In conclusion, I acknowledge the influence of new research approaches on my own research practice. However, I also recognise that I have primarily researched within the emancipatory paradigm, and consider the method developed for this study as belonging to the action research family – even though I prefer the descriptor, "co-operative inquiry", as used by Heron and Reason (2001) for labelling such participative and action-oriented research methods. This preference is because this latter terminology carries less ideological claims than "action research" and appears to embrace a broader the range of options for participation. Hence, based on the attributes of cooperative inquiry identified by Heron and Reason (2001), the following characteristics distinguish this particular cooperative study:

- The initiating researcher (myself) was external to the particular culture and practice that was the research focus. However, I became a co-subject.

- The study was set up as a "reciprocal role" inquiry, with co-inquirers expected to interact intensively within a role of equal status.

- The research involved "inside" and "outside" inquiry. Some action phases occurred when the whole group was together in the same place; other phases involved people doing their own activities at different times, in different locations. Consequently, participants came together mainly for reflection: to share data, make sense of it, revise thinking and to plan next actions.

- The inquiry had mainly "closed" boundaries, in that it was primarily concerned with what went on within and between the researchers. Interactions with others in the wider world were not part of the research, except in so far as they prompted ideas and reflections that influenced the research tangentially, rather than intensively. Nevertheless, there were aspects of the inquiry where "inside" and "outside" collided – such as when events in member's work and/or their personal lives severely impacted upon and disrupted the progress of the inquiry.

In due course, however, I created yet another descriptor for the cooperative, emancipatory and action-oriented method that developed in this study. I call it "postmodern socially critical inquiry" as this terminology accords best with the "lived experience" of this research project as well as acknowledging its methodological influences.

SOCIALLY CRITICAL RESEARCH

Inquiry in the socially critical (emancipatory) paradigm is, according to Preston and Symes (1992) "a questioning and insightful analysis of problems with a view to social transformation along ... democratic, equitable and socially just lines" (p. 9). Self-reflection and critique provide opportunities for empowerment and change through a reciprocal, dialogic research design (Dick, 1993; Fay, 1975; Lather, 1991). However, examination of the socially critical research literature discloses that it takes many forms and perspectives. As a result, defining or describing research in the critical paradigm is problematic.

As Figure 3.1 indicates there are a range of emancipatory research categories, revealing confusing overlaps, divergences and distinctions between the differently labelled types.[41]

[41] These include: collaborative inquiry research (Schensul & Schensul, 1992); action research (Kemmis & McTaggart, 1988; Posch, 1996; Winter, 1989); participatory action research (Kemmis & McTaggart, 1988; Wadsworth, 1998); action science (Argyris, Putman, & McLain Smith, 1990); participatory inquiry (Hart, Taylor, & Robottom, 1994); co-operative inquiry (Heron & Reason, 2001; Reason, 1994); and democratic action research (Jensen et al., 1996).

Nevertheless, "action research" is widely used as a collective term for the many forms of critical collaborative research. Carson (1990) comments that this type of research has two common points. First, it is underpinned by the belief "that we may develop our understandings while at the same time bringing about changes in concrete situations. Second, because such inquiry intends to draw together research and practice, it runs counter to the present tradition, which views these as separate activities" (p. 167).

Reason (1988) and Heron and Reason (2001), expand on these points, describing this kind of inquiry as that which is *with* and *for* people, rather than *on* people. Reason (1988) states:

> that it is a way of doing research in which all those involved contribute both to the creative thinking that goes into the enterprise – deciding on what is to be looked at, the methods of the inquiry, and making sense of what is to be found out – and also contribute to the action which is the subject of the research….In its fullest form the distinction between researcher and subject disappears, and all who participate are both co-researchers and co-subjects…[It] is therefore also a form of education, personal development, and social action. (p. 1)

At the broadest level, Reason (1994) continues, this kind of inquiry has researchers working openly, directly and collaboratively with the primary actors in their various fields of interest in order to build societies based on deep participation and a "holist world-view". Reason and Heron (2001) later augmented the stated purposes of such inquiry adding that a primary purpose of such research:

> …is to produce practical knowledge that is useful to people in the everyday conduct of their lives. A wider purpose …is to contribute through this practical knowledge to the increased well-being – economic, political, psychological, spiritual – of human persons and communities, and to more equitable and sustainable relationship with the wider ecology of the planet of which we are an intrinsic part. (p. 2)

Like Lather (1991) and Smith (1990), Reason (1994) and Heron and Reason (2001) argue that socially critical forms of inquiry, that deliberately critique existing conditions and aim to be inclusive and transformative, characterise a new paradigm for human research that represents a discontinuity with previous worldviews and methods. Wadsworth (1998), an exponent of participatory action research,[42] also emphasises the paradigmatic difference of such research from much conventional research. To illustrate these differences, she argues that the latter typically commences with an hypotheses or research question and concludes with a set of recommendations (for example), while the former is characteristically an

[42]This is commonly referred to as PAR and is perhaps the most highly participative of all the forms of emancipatory research.

ongoing inquiry with a circular flow of interrelated events. Through such alternative methods, states Wadsworth, researchers "have come to understand the practical and ethical implications of the inevitably of the value-driven and action-effects of their inquiry" (p. 3). Moreover, the more inclusive forms of social science research that parallel "new paradigm" research "are contributing to the forging of a new consciousness and a new experiential epistemology" (Reason, 1994, p. 54) that now constitute part of the debates about how we understand all science and all research.

When applied to the field of education, socially critical research denotes a fundamental interest in the emancipatory interplay between social critique (reflection) and action. As such, it contrasts markedly with earlier forms of educational research that largely emanated from the positivist tradition and which have been defined mainly as variants of educational psychology (Eisner cited in Lather, 1991). Carr and Kemmis (1986), early advocates of emancipatory educational research, describe the shift as research *for* education, rather than research *about* education. Since the 1980s, many educational researchers have followed their lead, embracing the tenets of the emancipatory research paradigm and applying it to educational issues and contexts (Elliott, 1991; Noffke, 1995; Posch, 1996; Winter, 1996). Sociocultural concerns about authenticity, alienation, ownership of knowledge, hierarchical schooling systems, oppressive roles, and the potential for emancipatory actions, have become the substance of educational research. As McCutcheon and Jung (1990) observe, "by and large, the critical perspective involves a concerted effort to re-examine the taken-for-granted and institutionalised constraints of schooling" (pp. 144-151).

A critical methodological approach, whether in the social sciences or in the field of education, represents a distinctive path to inquiry. Essentially, this is one that challenges ideas about the production and legitimation of knowledge and explores the idea of research as "a democraticised process of inquiry characterised by negotiation, reciprocity, empowerment – research as praxis" (Lather, 1991, p. 16).

The Research Method: Action Research

The previous section provided an overview of the theoretical orientation of this study. In this section, I discuss the study's specific research method – action research[43] – and show its relevance to educational change, to environmental education and to this project.

[43] Although I have indicated preference for "cooperative inquiry" as a descriptor for the research method used in this study, "action research" is the most commonly-used term in the research literature. Therefore I have chosen to use this standard terminology throughout this report.

In recent years, action research has become acknowledged as a significant research method associated with emancipatory praxis, its attraction to critical theorists stemming from its transformative capacities and empowerment focus. As Kemmis (1994) states, it is seen to offer "possibilities for linking social research and social action, and it has made worthwhile contributions to the improvements of education, science and society" (p. 47).

Action research has a number of forms and can be used in a range of contexts, from business and corporate improvement to community development in impoverished nations. As has been stated, it also has an established place in education. There are, however, problems with this breadth. Some writers see it automatically as belonging to the "emancipatory" paradigm (Grundy, 1986; McCutcheon & Jung, 1990; Wadsworth, 1998; Zuber-Skerritt, 1992) while others view it as not necessarily of a different paradigm, concluding that action research can be applied in either a positivist, an interpretist or in a critical perspective. Whyte (1991) notes, for example, that some forms of action research are highly controlled with the researcher aiming to be the principal change agent as well as controlling the research agenda. This form of action research would not constitute emancipatory inquiry, instead fitting the category of positivist action research. The use of action research for business improvement, for example, is seen as sitting in the positivist paradigm. By contrast, applications of action research, such as those aimed at improving the practice of individuals – as in the teacher-as-researcher movement developed by Stenhouse in the 1970s – have been identified as falling within the "interpretist" paradigm (McCutcheon & Jung, 1990). Action research literature can therefore be confusing for researchers who need to be cognisant of their own methodological orientation, as well as that of the writers whose works they are consulting, when making decisions concerning research practice. To overcome such confusions in my own research, I have mainly referred to the work of action researchers who reveal an interest in critical approaches and/or who explicitly locate their research within the critical paradigm.

Characteristics of Action Research

As the name suggests, action research is a method which has the dual aims of action and research (Dick, 1993) with the creation of change being the fundamental intention. For many, the image of a spiral consisting of continuous and overlapping cycles of self-reflection (planning, acting, observing, reflecting and critical analysis) represents the key characteristic of action research (Kemmis, 2001; Wilkinson, 1995; Winter, 1996). Dick

(2000) considers that the pursuit of both action and research and the spiral process are the defining characteristics of action research.

Action research is a cyclical process in two ways, as French and Bell (cited in Holly, 1991) suggest. First, it is a series of activities within a cycle – an iteration – and, second, it is a series of cycles. Hence, it is ongoing and constituted by a flow of interrelated events over time. Thus, action research is not a linear methodology. It starts with reflection on current actions, including *inactions*, and proceeds to new actions which are, themselves, researched. What results is a continuous spiral with each cycle leading naturally and inevitably through to the next (Wadsworth, 1998). As Grundy (1986) comments, "discourse and practice... are brought together so that improvements in practice and in understanding can be made systematically, responsively and reflectively" (p. 28).

The process, however, is not as neat as suggested as stages overlap, and initial plans can become obsolete in the light of learning from experience. As Kemmis (2001) writes:

> In reality, the process is likely to be more [sic] fluid, open, and responsive. The criterion of success is not whether participants have followed the steps faithfully, but whether they have a strong and authentic sense of development and evolution in their practices, their understandings of their practices, and the situations in which they practice. (p. 595)

Carson (1990) considers that there are two central ideas that distinguish action research in the critical tradition. The first is that it is underpinned by the belief "that we may develop our understandings while at the same time bringing about changes in concrete situations" (p. 167). Second, because action research intends to draw together research and practice, it runs counter to other research traditions which view these as separate activities. Carson considers that it is these basics which also set action research apart from ordinary problem solving, sometimes referred to as "arrested action research", because the changes are potentially long-term, indepth and widespread.

Carr and Kemmis (1986) and Kemmis (2000) reinforce this idea of the centrality of significant change through research. They note that, unlike other forms of research which set out to describe or to understand some aspect or problem, action research also sets out to change, for the better, a situation in the direction of greater "emancipation". As Kemmis (2000) writes, critical action research aims to:

> …help people recover, and release themselves, from the constraints of irrational, unproductive, unjust and unsatisfying *social structures* that limit their self-development and self-determination….[It] is a social process in which people deliberately set out to contest and to reconstitute irrational, unproductive (or inefficient) unjust, and/or unsatisfying

> (alienating) ways of interpreting and describing their world (language/discourses), ways of working (work), and ways of relaying to others (power). (p. 597-8)

Therefore, emancipatory action research aims at not only improving outcomes and practitioners' self-understanding but also to assist them to arrive at critique of their social and educational work and work settings (Kemmis, 2001). This is change from the inside.

Wadsworth (1998) also focuses on this aspect of embedded change through action research, stating that action research "is not just research which we hope will be followed by action! It is action which is researched, changed and re-researched, within the research process by participants" (p. 9). Change, then, is not an additional benefit of action research – it is fundamental to it. Action researchers have the goal of facilitating beneficial change "by critically reflecting on the historical, political, cultural, economic, geographic and other contexts which make sense of it" (Wadsworth, 1998, p.13). Furthermore, change does not just happen at "the end". It happens throughout, with a hallmark of the process being that it may change shape and focus over time, even unexpectedly, as participants focus and refocus their understandings about what is happening and what is important to them.

Action research is an imprecise form of inquiry. Action researchers know, more or less, where it is coming from and where it is going to, but do not know precisely where it is going to end up or what the new situation will be like. However, it "does not consider this to be an embarrassment" (Wadsworth, 1998, p. 6). The legitimacy of action research as an inexact process and one where the outcomes are liable to change is also affirmed by Winter (1998). He emphasises that the generation of knowledge, defined and determined by the participants and context of an inquiry, inevitably "entails an assumption that once the inquiry is underway and once one begins to learn from the first phases of the work, [that] the focus and the scope of the inquiry are likely to change (p. 63). For a conventional inquiry this would be highly regrettable, because it equates with "starting again", however, this is not the case in action research. As Winter stresses:

> The progress of one's inquiry over time – noting what happens as different things occur, as the situation develops: all this is essential to the learning process….For the focus of an action research project to shift is by no means… a defect of the original plan: it can be a positive indication of innovative, creative thinking. (p. 63-64)

Action research, then, is an evolutionary research process well suited to environments in transition or where there is a desire to explicitly bring about change.

As well as consciously intending change, critical action research is also a deliberately social process. Because it focuses on social practices and understandings where meaning is known only through the social processes of language and social situations, action research engages the action researcher in deliberately involving others in all phases of the research process. This represents a major conceptual shift in terms of the ownership of the research process, whereby researchers are constituted as "insiders", directly owning the research, as opposed to "outside" researchers. As both Heron and Reason (2001) and Reason and Bradbury (2001a) state, "outsider" researchers may interpret or inform the practices that are being researched, but they do not form them, have limited power to transform them, and rarely live with the consequences of any transformations that occur. Participants involved in action research, by contrast, are deeply involved in all aspects of the research process – from creative thinking about what goes into the endeavour, to decision-making and contributing to the action which is the subject of the research. Baldwin (2001) highlights this with the following comments:

> Relationship is fundamental to the creation of reality, and a [method] that separates the researcher from the researched denies that relationship. Ontologically, such a process would invalidate knowledge created, because it would not construct a reality that has meaning for the subjects of the research. (p. 289)

Thus, critical action research is not about "extracting secrets" from a group of research "subjects" but about the full involvement of participants in the decision-making and in their having ownership of the research process as well as the outcomes of the research (Robottom & Hart, 1993, p. 65).

Critical reflection is another distinguishing feature of critical action research. As a spiral consisting of continuous and overlapping cycles, the completion of one cycle becomes the beginning of the next, with each cycle involving the interrelated steps of planning, implementation, observing, reflection and critical analysis. Grundy (1986) describes the reflective "moment", or phase, as looking back to previous action through methods of observation which "freeze" practice so that it can be recollected, analysed and judged at a later time. Reflection also looks forward to future action through the moment of planning, while action is retrospectively informed by reflection through planning. Unlike the "casual plan, act, sense, and re-plan by which we operate the continuous percentage of all our waking lives" (Tripp, 1990), action research:

> …consciously and deliberately uses the action research cycle, leading to "strategic action", which involves action based on quality information, in contrast to that which is a result of

> habit, instinct, opinion, or mere whim on the one hand, and irrelevant, subjective, and incomplete knowledge on the other. (p. 159)

Leitch and Day (2000) comment that what distinguishes reflective practice within a critical action research process from the widely used concept of the "reflective teacher" (Schon, 1983), is that in the former, individuals are forced to draw all their thoughts and ideas together in such as way that new observations are made and change is manifested. In the latter, reflection could remain tacit and amorphous, with little perceivable benefit to practice. "Critical" reflection in critical action research is of paramount importance because it is questioning and explicitly and deliberately political. Overall, critical action research reveals a research method that explicitly forces practitioners to turn their theoretical reflections into action through a process embodying democratic principles and biased in favour of the least powerful (Hall, 2001).[44]

Action Research in Education and Environmental Education

Because of these principles of democratic decision-making, inclusive practice and focus on change, critical action research has been quite energetically embraced in the field of education. This is so because of dissatisfactions with "traditional" educational research practices, often based on psychology, and with earlier forms of classroom action research that, typically, have not take a broad view of the relationship between education and social change (Elliott, 1998). As Carson (1990) comments "true critically reflective action research is characterised by a continuing program of reform where the eventual hope would be a new kind of school and a new kind of society" (p.168). Kemmis (1994) elaborates further, commenting that critical or transformative educational action research encourages teachers to treat their own educational ideas and theories, work practices, and work settings, as objects for analysis and critique. He continues:

> On the basis of careful reflection …teachers may uncover theoretical ideas or assumptions that turn out to be unjustified and liable to lead them astray in their teaching…. Concerning their practices, teachers may find ways in which practices shaped by habit or tradition have become irrelevant or useless…. Concerning the educational settings in which they practice, teachers may discover how the structure of the settings may place obstacles in the way of attaining educational goals. (p. 43)

[44]It is evident that the most recent developments in action research reinforce this "political" view, being applied most notably where disadvantage attributable to characteristics such as gender, ethnicity and social class is profiled and deconstructed as the action research proceeds in order to overcome inequalities in knowledge and power relationships amongst research participants (Bell, 2001; Kemmis & McTaggart, 2000; Maquire, 2001).

MacNaughton (1996) also supports these purposes, claiming that action research practiced within the tenets of a critical educational framework aims to generate knowledge that is both practical and strategic and based in the practices of everyday educational endeavour. Consequently, one of the functions of action research is to uncover ideological distortions and to use methods of critique to uncover structural constraints to change. It must also be practical, she emphasises, "the aim [being] to create wiser and more just educational practices" (p. 31). This kind of action research, referred to as "fourth generation" action research by McTaggart and Garbutcheon-Singh (1988), aims to contribute to a changed and improved world because it works for changes to existing social practices and uses critical reflection and social critique as key research processes. Thus, in a school created or re-created using action research, "the pedagogical practices of teachers are not shaped by an organisation defined in terms of power relationships, but one which maintains the conditions of free and open critical discourse" (Elliott, 1998, p. 183). Additionally, states Elliott, critical action research can provide a productive means by which the collaborative reconstruction of the professional culture of teachers can lead to such pedagogical change. For this reason, it is seen as offering a great deal in terms of teacher professional development.[45] As Winter (1996) comments, critical action research can extend "ways of investigating professional experience which link practice and the analysis of practice into a single productive and continuously developing sequence, and which link researchers and research participants into a single community of interested colleagues" (p. 14).

Action research has the potential to become an *extension* of professional work, not an *addition*. Because it is a process that involves reflection, development of understanding, and changes in practice as indicated by the term "professional development", these two assertions are best achieved together even though they can be separated conceptually (Winter, 1996). However, Zeichner (2001) cautions against attributing too much to the potential of action research as teacher professional development. He suggests that, in spite of the growing testimony in the literature about the positive claims associated with teachers during action research, there are actually few cases where the professional development has been systematically studied; where researchers collected data to examine the conditions under which the action research was organised and supported, and then studied its impact on teachers, pupils and schools. It is hoped that the action research of this study, linking the development of practitioners with improvement of practices will help fill this gap.

[45] Elliott (1998), Posch (1996), and Zeichner (2001) have written extensively on this aspect of educational action research.

As indicated earlier in this section, critical education theory and research approaches have also influenced environmental education, with debates about research paradigms and methodological issues being little different from those in education generally, or in broader areas of social inquiry (Robottom & Hart, 1993). Advocacy for critical research frameworks and methods, particularly action research, for environmental education has been considerable.[46] van Rensberg (1996) for example, comments that action research provides the "transformative" orientation needed "to engage with social and educational change towards sustainable living in healthy environments" (p. 68), while Robottom and Hart (1993), draw on the ecological language and metaphors of new paradigm research[47] to argue that critical theory is "entirely congruent with the ecophilosophical worldview in environmental education" (p. 53). Central to this endorsement is recognition of the shift from objective inquiry to critical subjectivity,[48] an intrinsic feature of research that is "by" rather than "on" or "for" practitioners. Such a shift problematises the research process. Knowledge, for example, is accepted as a social construct and is therefore always provisional, while what counts as knowledge is recognised as a dialectical unity of both theory and practice (praxis). Critical knowledge in action research is practical and action-oriented with the potential to enlighten and catalyse social and political change (Green, cited in Robottom and Hart, 1993, p. 11). With such perceived promise for social and environmental transformation it is not surprising that action research, an inquiry method that embodies the principles of praxis, critical subjectivity and participation, has been granted some prominence in environmental education research literature.

Action Research in this Study

Arguments about the appropriateness of action research for creating change have guided my own decisions about using this method in this study. Not only did action research seem suitable for addressing my critical concern about the need for social and environmental change in relation to the state of the planet, but its recognised place in educational change literature, and its support in environmental educational research literature also favoured this decision. As I investigated the literature on action research, however, I became aware of the many forms of action research and its many descriptors. Nevertheless, there is enough

[46] In addition to those already mentioned, these include: Elliott (1991); Fien (1993); O'Donoghue & McNaught (1991); Shallcross (n.d.).

[47] This includes the use of terms such as: "holistic", "inclusive concerns"; "deep inquiry"; the creation of a "dense web of knowing"; and "networks" of understanding.

[48] The former tries to eliminate or minimise "important parts of our humanity", such as biases, prejudices and anxieties by becoming detached, objective, analytical, clinical and "pure". The latter seeks to go beyond the subject-object split, accepts accounts of primary subjective experience, raises it to consciousness and uses it as part of the inquiry process (Robottom & Hart, 1993, p. 53).

commonality to guide an action researcher through the cycles of their collaborative inquiry especially if one is cognisant of the methodological orientation of the authors being consulted.

However, the work of Leitch and Day (2000) developed my understandings about action research in a new way. While much of the literature about emancipatory action research presumes that action research is a collaborative process, this it is not necessarily so. Leitch and Day's paper discusses two contrasting, but complementary, forms of emancipatory action research, both of which were practiced in this study. The difference between the two, state Leitch and Day, "remains their respective starting points – within one, *the system*, within the other, *the individual*" (p. 185). As I noted in the first paragraph of chapter 1, this report is the story of two interconnected and overlapping research journeys, as represented in Figure 1.1. One is my personal inquiry of critical reflection, change and thesis writing that, until reading Leitch and Day's article, had been invisible. The other was undertaken in collaboration with research partners exploring curriculum and pedagogical practices in a school. Leitch and Day's discussion provided the means for linking both these inquiries and for making my individual research journey an overt part of this study. Leitch and Day suggest that both forms of critical action research, when applied to education, "present serious challenges to the definition of teaching as a profession" (p. 184). This is because both seek to challenge deep social structures and, thus, develop critical capacities.

The form of emancipatory action research to which Leitch and Day (2000) refer is encapsulated in the work of Whitehead (1989) who has developed a concept called "living educational theory", a personal process of change and reflection. While the initial emphasis of Whitehead's approach is on individual introspective rather than collective action – the hallmark of emancipatory action research – this individual form of action research is also emancipatory. This is because it entails inquiry into the contradictions between the values held dear by practitioner-researchers but which may be negated or denied in practice. Whitehead suggests that exploration of questions such as "How do I improve my practice?" and "How do I live my values more fully?" are fundamental for improving personal practice. As researchers become aware of the values that drive their work, they also become clearer about what they are doing and why. Through their personal inquiries around these questions, practitioner-researchers may construct, and reconstruct, their own living educational theory.

This approach is not unlike “action inquiry” identified by Argyris and Schön (1974), and described later by Reason and Bradbury (2001b) as “first-person action research/practice”, aimed at fostering an inquiry approach in a researcher’s own life, and “bringing inquiry into more and more of our moments of action – not as outside researchers but in the whole range of everyday activities” (p. xxvi). As Whitehead (1989) comments, he has tried to direct attention to the living individuals and the contexts within which theory is produced.

As with collaborative action research, this individual form of critical inquiry is also a cyclical process. However, Whitehead (1989) suggests it “can be distinguished from other approaches in the tradition through its inclusion of “I” as a living contradiction within the presentation of a claim to educational knowledge” (p. 3). What emerges is a personal description and explanation of practice that become parts of living practice. Accordingly, inquiry can involve a variety of means for self-reflection, including autobiography, dialogical conversations, stories, reflective writing and journals. Drawing on the work of Whitehead, Marshall (2001) refers to the processes of self-reflection as “inquiring through inner and outer arcs of attention” (p. 433). Attending to the inner arcs involves scanning and tracking evaluative notes, looking for repetitions, patterns, themes, dilemmas, and key phrases charged with energy or that seem to hold multiple meanings. Pursuing outer arcs involves “reaching outside”, actively questioning, raising issues with others, seeking ways to test out developing ideas, or to turn issues and dilemmas into cycles of inquiry. The latter also involves private note-taking, but also pays attention to others and includes, for example, verbatim conversations where key phrases or ways of formulating meanings that help to target further “questing and questioning” are noted. Claims to knowledge may then be validated by groups of critical peers and may eventually contribute to the pool of living theory about education which has potential for generalisation (Whitehead, 1989).

The second form of emancipatory action research that Leitch and Day discuss is collaborative, or participatory, action research, well documented in the literature on critical action research and discussed earlier in this chapter. This involves researchers working within a self-critical community with co-researchers, committed to transforming “the system” in line with rational and democratic principles. Reflection takes on a social-reconstructionist mantle as practitioners confront the contradictions and dilemmas inherent in dominant, socially and historically embedded ideologies (Leitch & Day, 2000).

Modelled loosely on Whitehead’s approach and the writings of Lomax (1994), Marshall (2001), and others, the development of my own living educational theory interweaves both

forms of action research – the individual and the collaborative – into the single model presented in Figure 1.1. In this model, the largely solo journey of learning, reflection and thesis writing also has its own "action" component. This is the "living" practice and theorising developed in the collaborative action research project, which then feeds back and validates or changes my living educational theory. To this substantiation process has also been added another level of trustworthiness provided by a small group of critical peers who have been privy to my research endeavours. Thus, this dual action research process offers a reasonable level of confidence in my living educational theory, as it is grounded in authentic, collaborative "action", my personal critical reflections, and those of my research participants and critical friends.

Concluding Comments about the Research

In this section, I have outlined key aspects of my research journey. This includes the overall purpose and objectives of this research and my methodological standpoint as a researcher. Although influenced by recent postmodernist approaches, I have principally adopted a critical methodological approach as my guiding framework because of a desire to address, in a personal and practical way, my critical concern about the state of the planet. From this standpoint, the choice of action research as the method of inquiry was relatively easy because it explicitly ties research and change together in the one process. In this section, I also identified the two forms of emancipatory action research – the personal approach that guided the creation of my living educational theory and the collaborative action research process of the school-based curriculum change project.

In the next section, I describe the conduct of this study. This includes an analysis of some of the key issues and dilemmas in implementing action research, including matters of rigour, validity and researcher-participant relationships. I also identify and describe the specific research tools that were used throughout this study for data gathering, analysis, interpretation and reflection. In effect, these strategies helped create my "travel" snapshots, notes and diaries. I also outline my rationale for the way this report is structured. The final section of this chapter focuses on the background to this study, describes the research context, and provides an overview of how this inquiry actually proceeded in practice.

ISSUES, DILEMMAS AND PARADOXES IN CONDUCTING ACTION RESEARCH

Dick (1993) claims that taking on the responsibilities for change, as well as for research, makes action research a harder option than conventional research. Along with a commitment to the democratisation of the research, the responsibilities for facilitating

change add complexity to the research process, in particular, problematising the academic researcher's roles and relationships with the community with whom they enter into a research "contract". Matters of power and authority, especially in terms of the potential for exploitation and dominance in research relationships, lie at the heart of these concerns. Action research, however, offers alternatives to traditional roles and relationships for researchers. Dilemmas associated with these are explored in the following section, along with discussion about how I sought to manage these issues within the context of this particular action research process.

Multiple Roles and Skills of the Action Researcher

The summary of the action research project at Fernwood State School, provided later in this chapter, can only hint at the range and complexity of action researcher roles undertaken throughout this project. As with most post-positivist research, researcher roles in this study have been multiple and include the traditional roles of the qualitative researcher – teacher, advocate, evaluator and interpreter, as identified by Stake (1995), Glesne and Peshkin (1992) and others.

However, because action research is not research that is conducted on the school by the researcher, but is research for change that is by, with, and for the school (Kemmis, 1994; Wadsworth, 1998), the action researcher is deeply involved with the setting, the people, the processes of change and the outcomes of the research. Lincoln (1997) writes that the skills and dispositions needed by the inquirer intent on meaningful action are similar to those belonging to corporate presidents, trade union negotiators and diplomats. These include: the skills of facilitation, orchestration, mediation, portrayal and vision-creating; a commitment to diversity and pluralism rather than incitement to divisiveness; and a belief in working with groups in ways that encourage collaboration, mutuality and cooperation rather than conflict. Jensen, Larsen, and Walker (1996) add the roles of "inspirer" and "registrar" – where the "inspirer" (or mediator, agitator, provocateur, "tough guy") acts as the group's long-term memory. The "registrar" (or reporter) keeps a record of the events and occurrences during the course of the research, including reporting back to the group about itself, and registering information that is often completely uninteresting, but potentially significant, especially in cases of conflict.

The Academic Action Researcher

Lincoln (2001) comments that such skills are not those traditionally taught in university research programs and, hence, the *academic* action researcher is often ineffective. Rowan

(2001) supports this view, commenting that those who take for granted the "usual" cultural roles and values (especially of the university-educated qualitative researcher) cannot effectively engage in action research because they are likely to be too prone to enculturation and, therefore, unable to effectively facilitate change processes.

Stoecker (1997) discusses such issues for the academic action researcher in some detail, adding another layer of complexity concerning roles and facilitation skills in participatory research. He has identified three key roles for such a researcher. These are (i) the initiator, (ii) the consultant, and (iii) the collaborator. The role of initiator is perhaps the most paradoxical. One of the features that most distinguishes participatory research, he comments, is the belief that the research "question" should be generated by the community (in this case the school).Yet many projects do not happen without the initiative of someone with the time, skill and commitment – often an academic with a position of privilege, status and education. Stoeker indicates that, for the academic to be an effective initiator, they must also be an effective community organiser, which is different from the usual researcher role. He notes that "Most academics are not skilled in it" (p. 7).

Another paradox for the academic researcher committed to a participatory approach is that action research, at the theoretical level, dictates that the community should do the research themselves. However, the reality is that academics are often called in to operate in a consulting role. What commonly occurs, and what happened to some extent with the project at Fernwood State School, is that a research project is commissioned by the community and is implemented by the academic while being held accountable to the community. This is often the case as only the academic researcher has the time and energy to put into the task because the research can be included as part of academic duties. Community members commonly have more urgent and pressing things to do, either for their cause or in their professional duties, so that project tasks become voluntary "add-ons". A dilemma with the role of consultant is that the research may remain too much in the hands of the academic and a real transfer of ownership of knowledge and process may not occur. This dichotomy between those who produce the knowledge and those affected by it still exists, with the outcome largely dependent upon the inputs of the outside, committed researcher and upon the researcher's presence (Stoecker, 1997). In effect, this was the situation that emerged in this research project and that influenced progress throughout all phases of the study.

The third role that Stoecker (1997) identified for the academic in participatory research is that of collaborator. One of the tensions in this role lies between the fear that the academic

will use her authority to disempower the community and the fear that the academic will be placed in a subservient position in relation to the community, making her less useful than she might be otherwise. It needs to be recognised that the researcher has certain technical and knowledge expertise, while community members have better knowledge of community needs and perspectives. The aim should be to combine these strengths into a unitary approach to research, instead of either side using their resources to gain control in a research relationship. What is needed is not a traditional researcher who relates to the subjects of research as objects of inquiry but as the people in the setting with problems to solve in partnership with the researcher. This is a role strongly supported by advocates of participatory research (Heron & Reason, 2001; Park, 2001; Rowan, 2001).

Stoeker (1997) also draws a distinction between these three participatory researcher roles, and a set of functional roles needed for participatory research. The first is “animator” (part translator, part facilitator, and part self-esteem builder). The qualities needed for this role include: a commitment and desire to work with the community, willingness to experiment with new approaches, sound communication skills, flexibility and a readiness to learn from experience, intellectual ability and emotional maturity. The second functional role is that of organiser or mobiliser. Stoeker notes that this role is often confused or combined with the researcher’s role – the researcher being a catalyst and maintainer of the process – while the organiser mobilises support and energy. A third role that Stoecker has identified is that of “popular educator”. This is not the role of teacher with knowledge to dispense, but of a facilitator who encourages people to discover and construct their own understandings and, hence, builds self-confidence. Ideally, explains Stoeker, the expert knowledge of the academic combines with the experiential knowledge of the community members to create new synergies and ways of thinking about issues. Finally, states Stoeker, there is the role of the “participatory researcher”, “the person who knows how to find the references quickly, can construct a survey blindfolded, and can create a research process either with strong guidance from community members or in collaboration with them” (p. 10). He notes that this is a role about being a researcher with a commitment to transforming the social relations of knowledge production and to democratic participation in the research.

All these complex and overlapping roles may not be performed by the same person, comments Stoeker (1997). While one person might combine all these roles, it is more usual for people to share roles and for multiple people to occupy the same role. This was the case in the Fernwood action research – a mixing and sharing of roles between the academic

researcher and members of the school community, especially with Jo, the school's key project facilitator. Conscious of some of the multiplicities, complexities and paradoxes associated with being an academic action researcher, early in the life of the project I identified myself as a "researcher-facilitator" rather than simply as a "researcher". In this role, I was claiming for myself, and seeking to portray to the school community, that I was a researcher and activist – seeking to understand a situation, helping to achieve an outcome, and facilitating community participation as part of the research.

Power and Collaboration in Teacher-Researcher Relationships

In addition to this multiplicity of roles, there are other complexities and issues for the academic action researcher. Like Jensen et al. (1996), I was aware that one of the dilemmas of action research, indeed any research, is that the (real or imagined) status imbalance between parties is usually tipped in favour of the researcher. The risk of exploitation, dominance and subordination is a real one when one enters into a shared or joint venture. Indeed, Reinhardt (cited in Lincoln, 2001, p. 127), refers to the traditional research relationship as "the rape model". Acknowledging that relationships between teachers and academic researchers come with power differentials is therefore of central importance. As Jensen et al. (1996) state "Action research is not a private investigation; it is much more a commitment to good will and clear explanation of personal wishes and beliefs" (p. 68), in the context of the shared reasoning which different participants bring to the project. Nevertheless, as Johnson, Peters and Williams (1999) explain, quite often the "subtext of … exchanges with teachers contained implicit references to issues of power, vulnerability, risk, suspicion, frustration, guilt, recognition, status, fear of misunderstanding, and exploitation" (p. 3), despite attempts to provide antidotes to unequal power relations. Focus on "the human side" of personal interactions seems the best approach to addressing some of these issues (Fullan, 1999; Goleman, 1995; Hargreaves, 1997c).

Reciprocity and Sharing: Creating a Structure for Committed Engagement

One of the conundrums for the (consultant academic) action researcher around issues of power is that the researcher is perceived to be, and indeed *is*, a person with expertise (an "expert") from outside the organisation; otherwise they would not have been invited into the research. Consequently, breaking down the barriers that go with being both an expert and an outsider so that the researcher can becomes an "insider" (or at least an "honorary" insider), is a significant part of the task of the authentic action researcher. The action researcher needs to gain situational understanding and trust so that she can share her

expertise and build expertise in others,[49] both of which cannot happen if the researcher is a distanced and remote expert. Robertson (2000) comments that such reciprocity is an imperative, not only for the research process, but also for theory-building. Lincoln (1997) asserts that reciprocity and caring about relationships are significant criteria for the relational models of research that are emerging such action research. She notes, however, that these qualities are usually not only out of character, but have been despised, in conventional research because they undermine the commitment to objectivity of conventional inquiry, hence posing a threat to the social and scientific distance and neutrality of modernist science. In contrast, however, they fit well with the idea of sharing privilege and power.

Negotiating the Contract and Setting up Basic Rights: Getting Started

In terms of getting started, educational research is usually initiated in one of two ways. Either researchers seek permission to investigate a problem that bothers them, or some sponsor from "inside" educational practice "contracts" researchers to seek solutions for a problem defined as important by the sponsor (Stoecker, 1997). In this study, it was the latter approach that saw this study materialise. Generally, however, investigations emanating from the contract (which is not necessarily a written one) make others the *object* of another's scrutiny, raising ethical issues of exploitation, dominance and subordination. Action research, by contrast, seeks a different kind of contract that stresses an emphasis on shared rather than separate research/action concerns and gives high priority to sharing resources. The contract should be an "open contract" which can be renegotiated, rather than a fixed agreement. Such a contract becomes a set of agreements between the research partners that can be renegotiated as fresh insights and newly recognised interests come to light in the course of the project. The contract is therefore more about adjusting and verifying than being about rules and procedures. Thus, while the contract might include a research design for the project, a timeline and set of principles to act as a framework for further developments, these are open to regular scrutiny and revision as the project proceeds. Such was the case in this study, with flexible and open contractual features developed initially, then renegotiated informally several times over the life of the project.

An important aspect of this early contractual negotiation, often a mental agreement rather than a written one, is the setting-up of basic rights, especially the establishment of informed consent which contributes to the empowering of research partners (Glesne & Peshkin,

[49] This is the "expert on tap not on top" model.

1992). These rights include: a guarantee that teachers are not objects of research, identify how issues of confidentiality and anonymity will be addressed, and what happens to the outcomes of the research. In the case of this study, a letter was sent to the school principal (Appendix 2) at the beginning of the project. This letter explained how I anticipated a collaborative and collegial relationship with the school community, researching together and developing a joint project. The letter also emphasised that rights to confidentiality and anonymity in discussions or published materials would be respected.

However, while creating and respecting participants' rights is vital, it is also the mandate of the researcher to produce new knowledge and to make this known to others in the academic and educational community – hence research data should not be hidden, suppressed or sanitised (Jensen et al., 1996; Stake, 1995). In this study, ongoing processes of reflection and feedback served to reduce these tensions between disclosure and non-disclosure.

This problem of potentially conflicting rights in relation to research can be solved, Jensen et al. (1996) suggest, by an agreement about the right to veto. This ensures that nothing is published outside the circle of participants before it has been distributed and discussed, and before teachers have recognised themselves and their world in the descriptions and analyses. Nias, Southworth, and Campbell (1992) offer practical remedies for addressing such rights. Researchers gave staff members the right to veto use of any interview material for which s/he was responsible and any observations of events in which s/he was involved. In addition, the staff as a group could comment on any of the case studies to be written. The principle illustrated here, and crucial in action research, is that research relationships are founded on a contract that deliberately attempts to protect the rights and sensitivities of unequal partners. Generally, the right of veto is rarely exercised and, state Nias et al. (1992), the contrary is more the norm, with teachers either having no objections or providing constructive criticism when asked to review reports. While the right-of-veto was not an explicit element of the first contract put to the school at the start of this project – I was simply not aware of this as an explicit "rights" option – nevertheless I intuitively conferred this right to participants. Throughout the research process, I discussed issues arising from the data at meetings and in conversations, sought permission to present or publish from the research, and have provided drafts of papers, and this thesis, for scrutiny.

Building Relationships of Trust

Jensen et al. (1996) indicate that it is not possible to negotiate all rights and roles at the beginning of a project. They suggest that in the early days of research relationships,

especially where the exact nature of the agreements is still to emerge and where only a small part of the shared agenda has been established, action researchers can still seek to build trust and, consequently, avoid exploitation by aiming to satisfy three research functions. First, action researchers need to become dialogue partners who are reasonable to talk to, will listen and will offer interesting questions about what they receive. Second, as consultants, they should be prepared to make appropriate knowledge and experience of research and its dilemmas available to their partners. Third, action researchers need to become analysts who work on clarifying issues of interest to all parties and to concentrate on building a repertoire of suggestions for further work (Jensen et al., 1996, p. 69).

Fulfilling these roles and tasks implies research relationships built on trust. Lack of trust and respect are cited as the most frequently mentioned challenge in community-based research (Israel, Schulz, Parker, & Becker, 1998), and action research projects are not immune from these difficulties. While authentic action research has the potential to minimise such issues because of its open and participatory nature, it remains a challenge requiring continual investment of energy and will. This project was no different.

Making Power Visible

Once initial entry and working rights and conditions have been established, the quality of the relationship between researcher and teachers must be developed. This happens within the relationship, by experiencing cooperation through sharing project management, swapping and alternating functions, and being trusted as an analyst or planner, assert Jensen et al. (1996). A committed exchange between researchers and teachers not only seeks to make "power" differences visible, but also tries to secure a visible "giving away" of power by the power holders (Jensen et al., 1996). This might happen through the researcher actively working to get rid of "guru attitudes" where, for example, the researcher's ownership of the product of the research is replaced with an obligation to share decisions about the course and content of the work. This makes demarcation between the school's ownership of the project and the researcher's ownership more blurred.[50] Another way to eliminate, or at least ameliorate, the "researcher as expert" power differential is to secure a progressive growth in awareness of how work in project design and development is divided and allocated so that those with less power retain responsibility for their own activities. This was the approach undertaken in this project. Curriculum writing tasks became the

[50] I reconciled this dilemma by determining that, while the action research process was shared, the school's outcome would be the Learnscape manual while mine would be this thesis. Discussion with participants confirmed this as an acceptable solution.

major form of participation for most teachers, with the teachers themselves deciding with whom they would work, in what timeframes, and with what curriculum content.

Establishing and Maintaining Relationships: Acknowledging Constraints

Creating truly collaborative working relationships is a central tenet of action research (Dick, 1993; Heron & Reason, 2001; Jensen et al., 1996; Kemmis, 1994). This requires extensive communication and numerous opportunities for building relationships based on mutual trust and respect. However, there are often real and under-recognised constraints, largely missing from the action research literature, that limit achievement of such ideals. In this study several major constraints were identified.

The first significant constraints were time and distance. While the time available for this project was open-ended, in that there were no set deadlines for the completion of the project, time constraints on a day-to-day basis were very real. The time available for meetings or interviews, for example, was often restricted, as Johnson et al. (1999) also found when working in schools. In the early phases when communication with the school was by phone, fax or mail, there were frustrating periods trying to reach the principal or Jo, or spent waiting for return messages.[51] In this study, mutually agreed meeting times, when staff were not in class or involved in duties such as playground supervision, were arranged prior to the start of classroom duties at 8.00 am, or in morning tea or lunch breaks, with the occasional opportunity when a teacher had a "pupil-free" session. Most meetings were rushed and it was not unusual for pressing events or situations in the school to force the cancellation, or abrupt truncation, of a planned meeting because a teacher had to immediately return to classroom duties. After-school meetings were generally not an option as teachers often had to attend to school and family responsibilities. Finding a time when two or more teachers could meet together also proved difficult because of competing responsibilities. To add to these complexities, the research site was, at a minimum, a thirty-minute trip from my home or worksite. Thus, a meeting scheduled for 8.00 am meant that I needed to leave home by 7.15, putting pressure on my own family responsibilities. Rescheduling options were also limited as I needed to organise meetings around my own work schedule. Overall, time and distance presented a major constraint on the conduct of the project, especially in its early days when it was important to build relationships through face to face communication.

[51] Link-up by email during 1998 largely overcame this problem.

Another constraint to research practice related to the hectic, but erratic, nature and pace of school life, a situation noted by several researchers (Hargreaves, 1997a; Larson, 1999; Nias et al., 1992). In this study there were numerous lengthy periods when it was inappropriate for me to expect teacher inputs or to compel focus on the action research project – especially as I was aiming to be sensitive to teachers' needs and to respect their constraints. This was especially so at the beginning and end of the school year. There were also school holiday breaks for ten weeks of the year, and periods when long service leave was taken by two of the key participants in consecutive terms. Moreover, there were periods in the year for several weeks when my work as an academic prevented me for engaging with the project. Overall, the period each year for focused work on the project was quite limited.

In addition, those involved in the study were undertaking the project in addition to existing core responsibilities and duties. Commitment to, and availability for, the project consequently waxed and waned. On occasions, meetings had to be cancelled at short notice. Sometimes participants, including myself, had not completed what was expected for the next meeting. The principal left the school for a semester, taking an acting principalship at another school. Permanent staff changes occurred over the Christmas break. Such factors impacted adversely upon progress and commitment to the project, but had to be accepted as part of the "real life" experience of conducting action research.

The "volunteer" nature of the project also highlighted another constraint on the progress of the study, virtually unmentioned in the literature. This kind of project can impact not only upon participants' work lives but also on personal and family living. For example, a computer "crash" in 1999, saw the loss of the entire learnscaping program that Jo was preparing for publication.[52] Not only had she prepared this document in her "spare" time, she had to rewrite the document during one of her holiday periods. For my own part, the necessity to transcribe interviews and prepare documentation for the school meant that I was often working weekends, evenings and holiday periods completing jobs in this voluntary project at the expense of family responsibilities and personal needs. The prospect of "volunteer burn-out" was a major risk.

Overall, the reality of this research was that it was a messy, frustrating and, at times, chaotic process. Building and maintaining momentum for innovation and change when progress is haphazard, erratic and demanding can be difficult. It is challenging to remain

[52] This was the only digital copy.

true to principles of inclusivity, collaboration and deep reflection when such conditions prevail. Likewise, it is challenging trying to ensure that the research process represents good practice in action research, and is rigorous in the collection, analysis, interpretation and portrayal of data. Inevitably, given the day-to-day realities of conducting action research in schools, some compromises occurred, some principles lapsed and, at times, expediency won out as we tried to keep the project moving forward, however slowly. As Stoecker (1997) observes:

> [We are] so concerned with doing the right thing, and so trained to evaluate everything from every angle before we make a commitment to action, [we] can so often end up paralysed… My main advice is to think about the possibilities and give it a shot and learn from it. (p. 16)

CREDIBILITY AND VALIDITY IN NEW PARADIGM RESEARCH

Expedient decisions, compromises and shortcuts in this action research project, nevertheless, were not taken lightly. Even though sometimes the processes faltered, I was committed to trustworthy processes as an underlying research principle. However, Dick (1993) suggests that research requires responsiveness rather than precision. Hence, this study was conceptualised as "fuzzy" research with a "fuzzy" methodology, although responsibly planned and conducted.

Lincoln (1997) explicates this further, suggesting that the emerging mandates for action, and emerging understandings of what quality means in postmodern forms of research, "has signified that the old ways of determining the validity of social science research, along with ways of gathering data and making meaning of data no longer suffice" (p. 18). Instead, she comments, different criteria from those usually thought of in social science research are needed for judging the quality of inquiry where action is incorporated. In particular, she refers to the need for assessing the "new" researcher skills in facilitation, orchestration, and mediation, instead of relying exclusively on traditional assessments of validity in data collection and analysis (such as triangulation and member-checking). Hence, facilitation issues, and especially the dilemmas associated with the development of inclusive, democratic action research processes, were constant challenges.[53]

Nunneley, Orton and King (1997) also make a case for alternatives for assessing the quality of research processes with an "action" imperative. These authors contend that the notion of

[53] The ways I sought to resolve these and other ethical issues are detailed in the following three chapters. For each phase of each cycle, there is a section entitled *Research Protocols and Processes* which outlines the research processes and ways I gave consideration to ethics and validity as the study proceeded.

validity in action research is not a matter of fulfilling criteria at all, but of planning, testing and evaluating an action and its effects via analysis and discussion "*for a specific purpose right now and right here*" [their italics] (p. 5). To elaborate, they argue that, because the research problem, the participation of discussants, and the utility/ feasibility of a given design solution to a problem of practice, are all specific to a local situation, then the quality of a research process should also be determined by local needs and local criteria, rather than through conventional validity strategies. They see this as concern for the "vigour" of action research as well as its rigour, "with free-wheeling speculation and experimentation as well as accuracy and the conventions of research design" (p. 6).

These authors propose a set of five alternative criteria for action research projects – democracy, propriety (concerned with ethical issues), utility, feasibility, and accuracy.[54] They also insist that action research must meet all these in order to be considered "valid", where validity means "healthy" and "strong" within the local context of the project, and not a matter of fulfilling external criteria. These "validity standards", they proclaim, are pragmatic checkpoints in the process of inquiry: broad enough to allow differing useful interpretations and solutions to flourish, but specific enough to focus the researcher's attention on ethical and practical dimensions of the process of the inquiry itself. These criteria provided helpful process "checks" throughout the study, encouraging me to give regular consideration to such ethical and procedural issues. Given the "fuzzy" nature of action research, it would seem that such reconstructed "validity" criteria offer reasonable and practical measures for evaluating action research.

Other contributions to the reconceptualisation of research rigour in action research have been presented by Dick (1992, 1993) and Winter (1989). These authors refer to research "dialectic" as an important consideration in achieving trustworthiness in action research. Kemmis and McTaggart (2000) refer to a dialectic as seeing things from various viewpoints. While some might see the dialectic as similar to what is often conventionally referred to as "triangulation", in the context of new paradigm research practices it is probably closer to the concept of "crystallisation" (Richardson, 2000). Unlike triangulation that assumes a fixed point of understanding that can be validated by "different methods", crystallisation, instead, "provides us with a deepened, complex, thoroughly partial, understanding of the topic" (p. 934).

[54] These were developed, in part, from a U.S. Joint Committee on Standards for Educational Evaluation.

One way of establishing an effective dialectic, suggests Dick (1992), is through the use of brief and multiple action research cycles. This can be achieved by having cycles within cycles where, in each cycle, the researcher pursues multiple sets of data. Any two or more sources of information can serve the purpose of creating a dialectic, helping to prise apart familiar ideologies and to maximise understandings by focusing on agreements and disagreements. In many ways, the phases contained within each cycle of this study acted as mini-cycles, each providing a link to the next and building upon the previous phase. Thus, at each stage of critical reflection, the researcher may recall insights already acquired, confirm previous understandings, or decide that previous learning was inadequate and further explorations are needed. Between cycles, the researcher seeks data that challenges or disconfirms the interpretations already reached. Each cycle begins by refining the questions and methodology in the light of the previous cycle. Thus, dialectical processes shape data gathering and data analysis and reinforce the participative and qualitative attributes of action research. They also help facilitate economy in reporting, a major issue with action research. In this study, they have also helped shape the format of this report.

Dick (1993) suggests a variety of techniques be used to create dialectics in action research. These include: using different informants, the same informant responding to different questions that address the same topic from somewhat different directions, and information collected at different times. For this study, each of the above strategies was used to help create a dialectic. This kind of variety, asserts Lincoln (1997) is necessary for both the rigour required for quality research, and the vigour necessary to build trust and collaboration for the actions demanded by the newer participatory research paradigms.

While debate and redefinition of issues around quality, trustworthiness and credibility in action research continue to develop, many researchers believe that conventional strategies of triangulation and member-checking, often criticised as being too positivist, continue to have value for establishing credibility in the research process (Janesick, 2000; Lincoln & Guba, 2000). Broadly, triangulation suggests collecting and analysing data from a range of perspectives. It involves not only the collection of data from the point of view of people in different roles and positions in a situation but also involves the use of multiple sources of evidence such as interviews, documents and observations, which are reviewed and analysed together. Triangulation endeavours to ensure a comprehensive view of a situation by taking into account multiple perspectives. It also furnishes evidence of controversy and dissent and provides a basis for informed dialogue between people with different perspectives as well as increasing mutual understanding and appreciation of the issues at stake (Elliott, 1994). It

can also lead to convergence of lines of inquiry, making for increased likelihood that interpretations and conclusions are convincing or trustworthy. Such considerations were taken into account in this study.

Triangulation, particularly in action research which involves engagement in multiple cycles of research, also involves data collection and analysis, interacting with each other to help the overall process of the research become "less fuzzy" (Dick, 1992). Hence analysis consists of discovering themes and issues in the data which need to be addressed, and which clarify aspects of the situation and/or the nature of the project and constitute a framework for better understanding the problem or the situation. Thus, the analysis of one set of data indicates the need for more data which, when collected and analysed, may lead to yet more data for understanding and acting within the situation. Triangulation reinforces the dialectic in action research, helps to ensure deeper and multiple understandings of the research situation, and assists in the construction of improved and more appropriate, actions deriving from these enhanced understandings.

Member-checking is another strategy that helps to develop credibility in action research, triangulating the researcher's observations and interpretations with those of participants, as well as offering new ideas and analyses. In member-checking, participants are asked to verify the researcher's constructions by examining, for example, written drafts where the actions or words of the participant are featured, and reviewing the material for accuracy and palatability (Stake, 1995). As noted by Stake (1995), I also found that participants in this study expressed little interest in reviewing transcripts or drafts when this option was offered, and provided little or no written feedback, except for minor corrections. Consequently, I found that the most useful approach was to seek confirmation or comment through conversations and interviews (Winter, 1989). For example, I would seek immediate clarification of participants' remarks by statements such as "So, what you are saying is …", or I would raise issues or perspectives developed in earlier interviews or discussions and use these as a basis for further clarification, new perspectives or alternative interpretations. Such conservational member-checking proved to be invaluable for aiding progressive reflection, critique and planning. Eventually, however, significant written member-checking procedures also benefited this study, with Jo providing substantial feedback and commentary on this thesis as it began to develop some clarity and substance.

DATA GATHERING: FINDING OUT WHAT IS GOING ON

With issues of validity and rigour in mind, this chapter continues with an examination of the specific ways in which I sought to understand, as a basis for action, the research situation in which I was working. As has already been discussed, action research favours participative processes and "participation favours qualitative methods" (Dick, 1993, p. 16). Consequently, for this study I used a range of qualitative research techniques to create an extensive data record and to analyse and interpret the data so collected.

Research Techniques for Qualitative/ Participative Research

Elliott (1991) states that research techniques that rest on the assumption that they validate fixed and stable meanings are ill-matched to the requirements of action research and should be avoided. Instead, what is needed is data that develop "situational" and "practical" understandings that lead towards "wisdom" – wise judgements, decisions and actions about "how to realise human values" in a specific situation and time. Hall (2001) comments that participatory research is also a natural and common way of working. He notes that participatory research has always existed in social groups who have struggled to understand their worlds and then act, and is not necessarily done only by researchers, educators or community activists. Consequently, research practices such as data collection need to be applied in "naturalistic" ways in keeping with the experiential nature of the research approach. Unobtrusive methods that enhance, rather than disrupt, those seeking to act intelligently and responsibility are required. Thus, understanding and capturing the complexity of a situation requires a range and variety of research methods, many of which are shared with case study research (Guba & Lincoln, 1989; Stake, 1995).

In this study, a range of such data gathering methods were employed[55] to develop understandings about, and actions for, the school. These led to the creation of an extensive data record that was participative, naturalistic and iterative. As discussed in the previous section, these processes also helped create trustworthiness in the research process. These data collection techniques, discussed in detail in the next section, included:

- participation and observation;
- conversation;
- interviewing, tape recording and transcription –
    - indepth individual interviews

[55] Multiple methods of data collection, as outlined by Elliott (1994), Marshall (1995), Stake (1995), and Winter (1989) were utilised.

    - focus group discussions
    - electronic interview;
- a journal of anecdotes, conversations, emails, subjective impressions and reflections, accounts of meetings, and working notes;
- the collection of public documents relating to the situation, including *Earthworm* submissions, school documents such as prospectus, letters, parent newsletters, articles in newspapers and journals, teachers' curriculum plans; and
- photographs.

Participant Observation

Participant observation, especially within action research, is more a role than a technique for data gathering (Walker, 1985) and, as Marshall and Rossman (1995) indicate, is an essential element, to some degree, in all qualitative studies. Consequently, the participant observer has access to a number of different techniques that can be flexibly used and which include: observation, interview, conversation, document search, surveying or simply "hanging out". Recording entails the systematic noting and recording of the events, behaviours, conversations and impressions in the situation chosen for the study. As the name implies, participant observation demands first-hand involvement in the social world of the study. This immersion allows the researcher to hear, see and begin to experience reality somewhat as "insiders" experience it. This immersion also enables the research role itself to be used as an instrument. For example, if the researcher feels uncomfortable or embarrassed in a meeting, this may tell something about the nature of the meeting. Thus, the researcher's feelings, rather than being "noise" in the system, provide a starting point for possible further investigation. Feelings, impressions, undercurrents and non-verbal messages are all admitted as "data" and help in understanding the research context and in defining research issues. Discomfort, especially related to power relationships, as well as acceptance and openness, are therefore part of being an effective participant observer.

However, being a participant observer in action research offers special challenges. The researcher needs to manage a relatively unobtrusive role designed to aid in understanding the "big picture", while also finely observing huge amounts of fast-moving and complex behaviour, and acting obtrusively as a facilitator of change. These attributes are even more important, especially since participant observers have been challenged to consciously assess "situational identities" – to make decisions about taking part in a social setting rather than reacting passively to a position assigned by others (Angrosino & Perez, 2000).

In the early stages of this study I had a broad observational agenda, without pre-determined categories, as a basic for discovering recurring patterns of behaviour and relationships. Then, as patterns and dissonances were identified and described through early analysis of field notes, more context-sensitive observations followed. Later, the project became its own observational instrument, with the iterative process of reporting to participants helping to sustain interest and collaboration in the project and creating appropriate actions.

Conversation

Conversation, in the form of emails, interviews or as part of participant observation, is a useful way to collect and analyse data in qualitative research approaches and as a member-checking strategy. Feldman (1999) maintains that conversation is much more than a data collecting technique, as it can also be part of the research process of sharing and clarifying knowledge, thus facilitating understanding and the meaning-making processes of critical inquiry (Appendix C). Feldman has identified three kinds of critical research conversation – oral inquiry, collaborative conversation and long and serious conversation. The first, oral inquiry, describes the procedures that provide access to a variety of perspectives for problem posing and problem solving by jointly examining issues, concepts, texts and other features of the educational experience. He notes that these kinds of conversations are self-conscious – and can be self-critical – attempts to improve and understand practice. These kinds of conversations were a common part of my interactions with individual teachers in this study. By contrast, collaborative conversations are significant when groups of teachers are working together. Although I was not always privy to these conversations, reports about these collaborative conversations, gleaned during interview, indicated that these "went beyond pleasant and informative chats to become a place for research in which transformative processes occurred" (Feldman, 1999, p. 128).

The third example of conversation in collaborative action research is the "long and serious conversation", much like oral inquiry, but over a long period allowing for in-depth and extended exchanges. A common mechanism is what Feldman refers to as "anecdote-telling". This involves telling stories of practice, listening, questioning and telling other anecdotes. Knowledge and understanding about teaching and educational situations grow and are shared in conversations: ideas are gathered, some are acted upon, and new anecdotes are shared about that was enacted. Feldman (1999) identifies three processes – anecdote telling, the trying out of ideas, and systematic inquiry – as making up "enhanced normal practice" (p. 126). While opportunities for long and serious conversations were not

always possible in this study, given the constraints discussed earlier, they were still vital to establishing and sustaining the action research and generating knowledge, understanding and actions. Conversation gave participants reasons to stay in the research, to keep coming back, and to build a sense of belonging. As Feldman has emphasised, they were much more than the data that they contained.

Interviewing

One of the most important sources of data in qualitative research is the interview, now so ubiquitous and institutionalised claim Fontana and Frey (2000) that it no longer requires specific training. At its simplest, interviewing is about asking questions and getting answers, although for serious researchers, the purpose of the interview is to "obtain a rich, in-depth experiential account of an event or episode in the life of the respondent" (Fontana & Frey, 2000, p. 646).

In action research, however, it is important that the task of interviewing is philosophically congruent with the values and processes of action research (Coghlan, 2000). Power differentials between the interviewer and the interviewees should be consciously reduced. If an interviewee is not certain that both themselves and their data will be treated with respect both during and after an interview situation, they are less likely to be cooperative and open, which works counter to the processes of collaboration that are being sought in the research project. This emphasises the importance of listening in interview situations, where the interviewer really tries to build rapport and trust with participants through listening, as well as trying to elicit their thoughts and perceptions. Additionally, while structured interviews are perhaps less likely to be congruent with action research, sometimes they are necessary in order to collect necessary data. Overall, interviews are an essential source of data because they are about "human affairs" (Yin, 1994).

Consequently, in this study I aimed for the interviewing experience – as far as possible given the power relationships – to enhance personal relationships and built rapport as well as elicit data. Interviews were designed as opportunities for interviewees to raise ideas, queries and issues and provided opportunities for reflection and processing by both the interviewer and the interviewees (Walker, 1985). This latter process is what Dick (1993) describes as the dialectic, the gradual clarification of interpretations, by focusing on agreements and disagreements throughout the experience of the interview itself.

Interviews were a significant help enabling me to understand the context and purposes of the project through probing for information, clarifying understandings, exposing contradictions, and generating propositions, as well as providing opportunities for dialogue and exchange. However, as they are also subject to the common problems of bias, poor recall and poor or inaccurate articulation, it was also important for me to seek alternative or corroborating data from other interviews and from other data sources.

Individual Interviews

For this study, a range of interview types was conducted, with the primary type being the face-to-face, individual, verbal exchange form of interview (Fontana & Frey, 2000). In total, five individual interviews were conducted throughout the project, with two of the key informants being interviewed on more than one occasion. Fontana and Frey (2000) suggest that one of the benefits of the individual interview is that it allows for greater self-disclosure in order for alternative views to be clearly articulated.

In this study, a semi-structured interview schedule (Appendix F) was used as a starting point and as a means of gaining and retaining focus. As time was often limited, as previously discussed, this written schedule was helpful in keeping conversation "on track". During these interviews, opportunities were provided for responses to the pre-determined questions, as well as for free responses to open-ended discussion that allowed for issues to be explored in depth or for new issues and topics to emerge. When time was not a major factor, it was apparent that more open-ended conversation resulted, adding significantly to the rich and detailed responses already gathered.

Focus Group Discussions

Focus group interviews were also utilised. The advantage of focus groups is that they produce rich data that is cumulative and elaborative (Fontana & Frey, 2000). They are also more likely to enhance participative research processes than can individual interviews. Basch (1987) provides several advantages of focus groups over individual interviews. A key advantage is the synergism that results from the combined energy of the individuals in the group and the snowballing effects that result from a comment of one individual that engenders the generation of many more ideas from other members of the group (Fontana & Frey, 2000; Stewart & Shamdasani, 1990). Ramirez and Sheppard (1988) also note that focus groups allow participants to give multiple answers or to provide responses that researchers may not have considered. Furthermore, it seems that the potential for action learning amongst participants is considerable in the focus group, as each individual is

exposed to the ideas of others and submits their ideas to the group for consideration. This makes focus group interviews a powerful tool for creating reflection and new ideas, and for enlisting support for change. As such, the focus group interview has strong congruency with action research processes. In this study, focus group interviews were conducted with groups of participants who shared common characteristics – a group of parents in one instance, and two groups of teachers who had worked collaboratively on curriculum writing tasks. For practical reasons, especially as time was often a limiting factor, group interviews were also easier to organise.

My role in these interviews was to act as a moderator of the discussions (Appendix G), ensuring a focus on desired topics and issues, probing and provoking for responses, providing elaboration as needed, encouraging discussion on contributions, and ensuring that all participants could "have a say" (Dick, 1993). In many ways, this was an extension of the facilitation role already adopted and did not demand new skills. Overall, participants entered into discussions with high levels of support for, and trust in, the interview process.

Recording, Transcribing and Member-checking the Interviews

All face-to-face interviews were audio-recorded with interviewees' permission. Journal notes of interview sessions were then written, usually within an hour or two, to capture key points, episodes and the essence of each interview. Stake (1995) claims that "keeping the record of an interview is part of the artistry" (p. 66). This reconstruction of the session was further developed through post-interview journal writing. Interviews were then transcribed, although the overlay of voices meant that in group interviews some conversation was lost and it was sometimes difficult to identify speakers. In order to make the best possible transcriptions, all interviews were summarised and transcribed as soon as possible after the interviews took place, generally between one and three days. Although time-consuming, I found the transcription process very useful, as such close listening, and then recording of the data, helped to generate and deepen insights and reflections. Stake (1995) notes that interviewees are often dismayed with transcripts not only because of the inelegance of their sentences but because they often do not convey what was intended. In fact, I found that interviewees were totally disinterested in examining transcripts and would not even take them for examination.[56] However, the importance of an interview rests with the ideas and impressions contained in it, rather than with verbatim accounts attributable to specific interviewees, so this was not a major concern in this context.

[56] This may also be seen as a function of time pressures on the teachers and/or their trust in me as my insider status increased.

A more useful verification strategy was to use the many informal opportunities that arose during visits to the school, in order to "member check" interview data. This meant having "conversations" with interviewees in informal contexts such as in the lunch room, and, with Jo, through regular email contact. These opportunities, informal and irregular though they were, assisted in my interpretations of what interviewees had said and enabled them to add or modify ideas that had been put forward in interview. The result of this process was that I ended up with two valuable records of teachers' ideas – one set that was "fixed" as revealed in a single interview transcript – and another record that, like the action research itself, showed the evolution of ideas and perceptions. Overall, all the facets of the interview process – the interview itself, journal reflections, transcription, follow-up conversations, and formal data analysis during research cycles – provided opportunities for interviewees and myself for deeper and deeper iterative analysis and interpretation.

Electronic Interview

One final form of interview, an email interview (Appendix H) was also used. Fontana and Frey (2000) note that it is now possible to engage in "virtual interviewing" where internet connections are used synchronously or asynchronously to obtain data, offering potentially speedy return. Such interviews are also low cost. The email interview in this study arose from a short conversation with a project participant, not a school staff member, who I was unlikely to meet in person again. This hurried, initial conversation revealed, however, that this person had valuable insights, observations and critique of project processes germane to further development of the project. Consequently, I suggested an email interview in order to capture these views and to allow for some expansion of ideas raised during our short talk. Some time later, I emailed a set of questions to this informant to which he responded by email. This format had the attributes of a structured interview, where the interviewer firmly controls the focus and sequence of the interview through pre-set questions (Fontana & Frey, 2000). While perhaps not the most desirable form of interview in a collaborative project, Elliott (1994) suggests that this type of interview does have a place in action research. All things considered, this structured email interview provided me with insights and ideas from a key informant that would not otherwise have been obtainable.

Field Notes and Journal

To maximise data from observations and conversations, I also made formal and informal notes and jottings in a field notebook. These included: summaries of conversation, information about key events, impressions of personal dynamics, and key words denoting

new insights. As it was generally not possible to make these as they occurred, they were usually recorded prior to leaving the research site.

From these jottings, detailed entries were then written up – transforming ideas, insights, intriguing comments and perceptions gained through observation, into a source of data for later analysis. Elliott (1994) comments that action researchers have yet to fully articulate a method of constructing written records which is distinctive to action research. However, he suggests that the tools of ethnography used by many anthropologists and naturalistic sociologists are useful. In this study, some entries, such as emails, were simply a log – a basic record of events (Appendix D) that provided mundane descriptions that served an accountability function as well as a "running commentary" to aid in the recall of the "history" of the project. Other entries (Appendix E), however, were more like those in an ethnographer's journal and were a mix of stories and narratives about experiences, as well as theoretical analyses of these experiences.

Overall, this practice of journaling can provide the researcher with a rich resource of raw data for analysis and action. As Clandinin and Connelly (1998) note, it is a powerful way for individuals to give accounts of their experiences. Street (1990) writes that "the journaling process contains the potentiality to transform the individual's values and actions, to transform the chaos confronted in the situation and to contribute to the individual and socio-cultural understandings relevant to the area of professional practice" (p. 1). In this study, journal writing was a powerful tool for analysis and interpretation of situations and events. The fact that they were recorded illustrates the degree to which they were valued. Embedded in these journal entries were also diary-like entries that recorded personal reflections, such as the impact of the research process on my work and family experiences, and my perceived "failings" in the research process. These self-reflexive writings assisted in the continuous reconstruction of self as both a private person and as a researcher.

For this study, detailed journal entries were written after each school visit, usually on the same day or within three days. The jottings recorded in my field notebook provided starting points, which then developed into more comprehensive entries that became a mix of story, impressions, theoretical analyses, interpretations and reflections. I took the advice of Holly (1997) as a personal benchmark, and aimed to "write vividly" (p. 47).

Document Collection

Documents collected in the course of this study included school prospectuses, drafts of teachers' curriculum planning, project notes and school newsletters. As Hodder (2000) suggests, such documents are important for qualitative research because access is generally easy and low cost; the information differs from, and may not be available in, spoken form; and because these kinds of texts endure, giving historical insight into what has been done and how people think. At a practical level, document review also has the advantage of providing an unobtrusive and nonreactive method of data collection that is conducted without disturbing the setting, because the "evidence" has been "fixed" through publication. Marshall and Rossman (1995) state that documents are rich in portraying values and beliefs of participants in the setting, are useful in developing an understanding of the setting or group studied, and help to validate (or invalidate) developing perspectives. Wadsworth (1991) adds that they can also highlight discrepancies between how a situation is and how people would like it to be by revealing "silences" and omissions. Quite often documents also serve as substitutes for records of activities that the researcher cannot observe directly and can act as prompts for discussion which leads to the generation of further data.

A cautionary note about document review needs to be made, however. Rarely do the documents that are collected and reviewed have the same purpose as the case study or action research, usually having been written for some specific audience other than those connected with the research. As Yin (1994) writes, the researcher "is a vicarious observer, and the documentary evidence reflects a communication among other parties attempting to achieve some other objectives" (p. 87). By trying to identify these, the researcher is less likely to be misled by documentary evidence and more likely to be correctly critical in interpreting the contents of such evidence.

Photographs

Photographs have a long history in ethnographic research and also have a place in action research (Elliott, 1994; Winter, 1989). Unlike video and film recording, photographs can be made fairly unobtrusively. They provide a visual reminder of experiences and can trigger detailed memories and thus form a powerful stimulus for retrospective and reciprocal analytical discussion of data amongst participants. They are also valuable in contributing to the historical record of a project, particularly where the project has a physical dimension, such as the development of buildings and gardens. Photography can also produce data that "enlarges our understanding of sociological processes" (Harper, 2000, p. 727) and may

encourage viewers to reflect upon larger cultural realities than those readily evident in localised events and contexts. In this study, photographs have been mainly used to "concretise" my field observations and to develop my reflective practice (Harper, 2000).

RECORDING AND STORING THE DATA

The management, analysis and interpretation of qualitative materials is a complex process (Huberman & Miles, 1998) and organising and documenting the data in this study emerged as a significant issue. The large amounts of data arising from documents, transcripts, meeting notes, email messages and journal entries meant that, from an early stage, I needed to develop a comprehensive and efficient way of organising and documenting data. As suggested by Marshall and Rossman (1995) two separate collections emerged:

- The data folios – notes, transcripts, documents, journal entries; and
- The research report (this thesis).

These authors suggest that the separation of these two collections, while not an institutionalised practice in many qualitative research fields, should be seen as a means for increasing the reliability of the written report. In the first instance, "a systematic, coherent process of data collection, storage and retrieval (Huberman & Miles, 1998, p.180), makes the process of data analysis, interpretation and report writing a much easier process. In addition, these authors suggest that such organisation also allows the original investigator the opportunity to rework the data from new perspectives at a later date, or for other researchers to conduct separate secondary analysis of the database, independent of interpretations and reporting by the original investigator.

The Data Folios

For the purposes of this study, data were organised and stored chronologically, with all data relating to a particular action cycle stored together. This became a six-volume folio with a mix of data types in each folio, arranged by date of execution or collection. This ordering allows for rapid and easy data retrieval. Appendix A provides a list of contents of the data held in these folios, and highlights those items referred to directly in this research report.

In common with case study research, this study has generated a large volume of research material including letters, emails, meeting notes, interview schedules, investigator's field notes, photographs, workshop planning notes and journal entries. Some items, such as school planning notes, are handwritten on large sheets of butcher's paper, although most

items have been word-processed, recorded on computer disc, and always a hard copy made. Audiotapes and their transcripts are also included in this record.

Also arranged chronologically by collection date are documents originating from the school, including copies of the school prospectus, a case study written by Jo about the school's learnscaping project, and examples of school newsletters that refer to the learnscaping curriculum project. In addition, there are conference papers about the study and a draft of a submission to a research journal. These provide summaries of the study at significant stages, as well as critique and discussion of study processes and outcomes. Because these papers include analyses and interpretations of the study data, they are also part of the iterative analysis of the project.

The very large size of the data set prevents its inclusion with this thesis. Appendices C-H, therefore, provide sample emails, reflective journal entries, an interview schedule, and excerpts from interview transcripts. Also, due to the large size of the *Learnscapes Alive* manual developed during this study, a full copy could not be included. However, Appendix N shows the contents page of this document to indicate its structure and scope.

ANALYSING, INTERPRETING AND REFLECTING ON THE DATA

The previous section describes how data were gathered and sorted. This section examines how ideas, interpretations and resultant actions were developed. Since the action researcher is an active agent in the setting, data must be processed naturalistically and collaboratively as events unfold (Elliott, 1994). Thus, data analysis in action research does not occur as an end result of data gathering. Neither do interpretations develop separately from data collection. Interpretations take place gradually and are negotiated and "constructed" by the participants as they engage in the day-to-day business of the project, converging towards final interpretations over the study's multiple cycles.

Progressive Focusing

This iterative process is one of interim analysis with the development of emergent themes or constructs that are often fuzzy (Ryan & Bernard, 2000) and occurs even while new data continues to be collected (Huberman & Miles, 1998). Organising the experiences of the situation into categories therefore became a matter of "progressive focusing". Since information is processed naturalistically, discriminations of practical significance in the situation emerge progressively. This qualitative data analysis technique parallels a central feature of action research. As Dick (1993) explains, not only are the initial research

questions rough or “fuzzy”, the methodology is also “fuzzy” at the start. Such questions yield “fuzzy” answers in the early cycles, which in turn help to refine both questions and methodology, and lead progressively to less fuzzy answers. Progressive focusing in action research is both a methodological process as well as a data analysis technique that occurs throughout all phases and cycles. Dick (1992) suggests that one way to develop progressive focusing is for the researcher to focus on agreements and disagreements[57] in the data during interpretation phases, as these form the basis for developing more specific research questions to test emerging agreements and to explain emerging disagreements. As a consequence, interpretations emerge slowly and are constantly tested, thus increasing the credibility of the data and providing increased faith in the research outcomes.

Pattern Searching

Stake (1995) suggests some useful, additional strategies to aid in the processes of interpretation of qualitative data. He comments that the “search for meaning” that emerges from data analysis is really a search for patterns. Thus, data analysis techniques need to include pattern analysis – the coding of records and finding patterns – and issues analysis. In such analysis, the researcher looks for patterns or issues immediately, while reviewing documents, observing or interviewing. When a theme, pattern or issue is identified inductively, the researcher then moves into verification mode, trying to confirm or qualify the finding (Huberman and Miles, 1998). While significant meaning may sometimes occur in a single instance, usually, important meanings repeatedly arise. Often patterns are known in advance, having been drawn from the research questions, and therefore serve as a template for analysis. Sometimes patterns emerge unexpectedly from the analysis, and sometimes, especially if there is little time, patterns or significance can emerge through direct interpretation by asking “What does that mean?” (Stake, 1995). However, when more time is available, Huberman and Miles (1998), Ryan and Bernard (2000), and Stake (1995) suggest that data be looked at again and again; with the researcher reflecting, triangulating and being sceptical about first impressions and simple meanings.

Realtime Analysis

In action research, time is often a constraint in data analysis. Robson (1993) is strongly supportive of “realtime” data analysis and offers practical suggestions for how this might occur. As a first step, he suggests initial processing of raw data into a “write-up” made shortly after the experience, and that contains missing elements from raw notes,

[57] Stake (1995) calls this “categorical aggregation”, referring to the process as looking for corroborating and disconfirming incidents.

amplifications and corrections. Reflections which occur during this processing, such as an hypothesis as to what might be occurring, can be incorporated in this early process of analysis. Pattern-coding for determining genuine categories in the data then occurs, with the researcher arriving at provisional names for categories, which are then related to each other, with sub-categories being developed as needed. Next, core categories are developed and unrelated categories are discarded unless they can be linked to the core.

As a useful next step, Robson also suggests “memoing”. This is a means of capturing ideas, views and intuitions at all stages of data analysis and is primarily about the codes and conceptual relationships between them. After memoing, the “interim summary” is prepared, this being an attempt to summarise what has been found so far and to highlight what still needs to be found out. From these processes, the key ideas around which the researcher will focus their discussions eventually emerge. In this study, I utilised an amalgam of the data analysis approaches discussed here. These were mostly immediate, informal processes because of the imperative for “realtime” data analysis, but I also made use of pattern analysis, especially with interview data, to help develop insightful appreciation of the data.

Literature Review as an Aid in Analysis and Interpretation

Another significant tool used in data analysis and interpretation in this study was the review of literature. In action research, literature review is not a separate process from data analysis and interpretation. Invariably, relevant literature is not known until data collection and interpretation are under way. This then provokes the researcher to pursue particular lines of literature inquiry in response to the queries and questions thrown up during analysis, or the desire to search for confirming or disconfirming views about what the data is suggesting (Dick, 1993). Indeed, Dick suggests that the search for disconfirming evidence and argument in the literature, at the time that the researcher is making tentative interpretations, actually helps to reach conclusions with more confidence, which results in actions being better informed. Winter (1998) refers to this process as “dialectical analysis” and of “being theoretical” (p. 67) about the data, contemplating it, speculating about it and placing it in a wider context. Dick (1993) also advocates this practice of linking literature review with interpretation as it helps to “widen the dialectic” (p. 36) and give greater confidence to the interpretations. This process of generating interpretations, ideas and actions derived from both the evidence and from the literature was a major, ongoing research tool used throughout this study.

The data analysis and theory-making processes described above emphasise that action research is a continuously changing inquiry, with the understandings that are generated and the actions that are created always provisional. Indeed, both the situation and the research really have no end-state and the thesis represents a provisional and incomplete account of the research project (James, 1999). Accordingly, this calls into question the "academic norm" of presenting reports with the accepted sequence of separate chapters for literature review, methodology, research design, findings and conclusions. Winter (1996) states that the scientific structure is just "one *possible* format, *one* way of structuring and transforming experience to bring out its significance" (p. 25-26). Writers of reports based on action research projects, he claims, should not be overawed by the cultural authority of the "scientific expert" and should resist the scientific format and rhetoric of reporting research.

Action Research as Collage or Quilt

Since action research writing emerges from a different set of relationships – collaborative and action-oriented, rather than authoritative and observation-based – both Dick (1993) and Winter (1996) suggest that action research reports demand different ways of writing that account for their iterative, provisional and collaborative nature. Winter prefers to think of the text of an action research report in pluralistic terms, suggesting it be more like a collage than a description. This view concurs with that of Denzin and Lincoln (2000) who describe the "new" paradigm researcher as "bricoleur" or quiltmaker, a concept discussed earlier.

Lincoln (1997) proposes "portrayal" as a better term than "reportage" for describing the presentation of research emanating from "action" paradigms. This, she states, is "the ability to craft compelling narratives which give outsiders a vicarious experience of the community and which give insiders both a deeper understanding of themselves, and the power to act" (p. 23). Another suggestion that challenges traditional reportage is for action research to consist of various narrative accounts and their critiques, ending with questions and further possibilities not conclusions that are intended to be "convincing" (Elliott, 1994). Thus, taking account of these views about report writing in action research, as well as being cognisant of emerging critiques of scientific writing in higher education thesis writing more generally (Conle, 2000; Richardson, 2000), I eventually arrived at an alternative format for writing about the action cycles of this action research report. As Richardson (2000) writes, "There is no single way – much less one "right" way – of staging a text" (p. 936).

The Place of Critical Narrative

Central to this alternative is the concept of the action research report as a "critical narrative". This term, used in critical ethnography, suggests that research participants reassess their current understandings, relationships and practices through reading and writing that is insightful and engaging. Brodkey (1987) states that there are two parts to a critical narrative – description and critique. The description is essentially a narrative, whereas the critique is an interruption of the narrative to provide a "systematic, verbal protest against cultural hegemony" (p. 67). The "critiquing" aspects of critical narrative can provide valuable transformative tools that allow understanding of the world in new ways and help in the communication of new ideas (Gudmundsdottir, 1995).

Narrative, by contrast, refers to the structure, knowledge and skill required to construct a story, suggests Gudmundsdottir (1995). She also maintains that narrative and storytelling have become one of the main themes in educational research, and that it is through the telling of stories that one gets to know "pedagogical content knowledge". Storytelling also helps in problem definition, report Goodson and Walker (1995) and offers "a kind of intermediate technology of research adapted to the study of practical problems in realistic timescales" (p. 187), a characteristic of action research. In discussing the use of stories in action research specifically, Burchell and Dyson (2000) comment that narratives can provide insights for writers and readers by aiding reflection and assisting in the recognition and addressing of emerging issues and dilemmas. After taking these perspectives into account, storytelling emerged as an important tool in this study, providing a powerful way of aiding reflection, understanding and communication of its processes and outcomes.

Structuring, Writing and Presenting this Report

The following section explains further how narrative and "alternative" forms and structures for thesis writing have influenced the structure, writing and presentation of this report. Suffice to say, I have not used a conventional "scientific" format of separate chapters for literature review, followed by a report of research "findings" and interpretations detached from accounts of the research process. Instead, this report highlights the interdependence of events, process and outcomes, expressed through the intermingling of narrative, critique and literature review, followed by reflection and analysis.

Like Conle (2000), I did not commence this research process with a review of literature. Instead, relevant literature was accessed, more or less continuously, throughout the whole

of the research process. I have sought to express this process authentically in this final report by placing multiple literature reviews throughout the thesis, rather than presenting a complete literature review at the beginning of the report. This format was decided upon in order to reflect the reflexive nature of action research in which understandings developed from both literature and practice help generate actions, and vice versa. Therefore, as well as chapter 2, the literature review that explicates my critical concern, each of the chapters based on the three action research cycles contains its own review of literature. Thus, each cycle chapter is a mix of narrative, critical commentary, literature review, data analysis and interpretation. Conclusions that are intended to be "convincing" have been avoided with a focus, instead, on exploring issues and dilemmas, raising questions and presenting possibilities. As Winter (1996) suggests, these imprecise outcomes are more compatible with the role of the author as collaborator and participant, rather than observer and judge.

To guide this less conventional report writing process, I found the following suggested criteria[58] for reporting action research to be helpful. Elliott (1994, p. 58) suggests that an action research report should:

- provide a narrative account of the change process as it unfolded from a variety of perspectives: researcher, teachers, parents. This should tell a story in non-technical language and give the reader a sense of what it was like to be involved;
- portray the change process in context, highlighting those aspects which illuminated the experience of those involved;
- focus on problematic aspects of the change process;
- reflect upon these problematic aspects from different angles or points of view;
- reveal how understanding of the situation and the problems and issues evolved, in the light of new evidence;
- describe the curriculum and pedagogical strategies generated during the course of developing understanding of the situation;
- assess the consequences of curriculum and pedagogical strategies, both intended and unintended, for the quality of the change process; and

[58] These have been slightly modified to account for this specific context and study.

- describe, justify and critique the methods and procedures used to gather and analyse data.

Elliott observes that the construction of a report that satisfies these criteria is not an easy task. However, I am convinced that challenging the norms of traditional research writing with such a structure presents a more authentic picture of non-linear research practice than does the scientific report, and is truer to the spirit of participative inquiry.

Context, Background and Evolution of This Study

So far this chapter has discussed why and how this action research study was conceived, conducted and reported. I have revealed the methodological orientation of this study and some of the methodological issues and dilemmas that surfaced. Choices about research techniques and their application have been explained, as well as a rationale for the non-traditional reporting style. The next section provides a description of the research context and the study background, and concludes with a representation of the evolution of this action research, illustrated through diagram and tables.

The School Context

As was mentioned briefly in chapter 1, Fernwood State School is a medium-sized primary school in Logan City, situated on the outskirts of Brisbane, the capital city of Queensland. The school opened in 1983 and has a student population of around 500 students from Preschool to Year Seven. There is a Principal, a Deputy Principal, eighteen full-time classroom teacher positions, a full-time preschool teacher, with additional staff in part-time positions, including a music teacher, computer teacher, teacher librarian, learning support teacher, Languages other than English (LOTE) teacher and physical education teacher. There is also a range of ancillary staff, including administration officer, casual office staff, teacher aides, cleaners and a janitor-groundsperson. Like most schools, it operates with a large volunteer workforce of parents involved in duties such as tuckshop, classroom and library support, ground maintenance, fund-raising and committee work. The school draws on a predominantly middle class clientele who live locally in well-established homes, and many commute into Brisbane for employment. The suburbs surrounding the school have a wide range of commercial, community and recreational facilities.

The school is situated in six hectares of grounds and backs onto an environmental reserve which connects to the Daisy Hill State Forest. This area is recognised as a significant part of a koala habitat that runs through the south-eastern corner of Queensland. Indeed, a koala

"corridor" connecting local koala habitats with the Daisy Hill Nature Reserve passes through the schoolgrounds (Figure 3.2).

Figure 3.2 Koala corridor passing through the schoolgrounds.

The general impression of the schoolgrounds is of a green and leafy "natural" environment. However, the school community has invested many hours and considerable funds into maintaining and enhancing its grounds over the years.

The school has a strong record of educational innovation. Students are organised into multi-age (vertical) groupings, with children of different ages sharing the same teachers and classrooms. Ideas and skills are addressed in varying depths within the one classroom with children benefiting from peer support, extension opportunities and developmental learning. Because siblings are more likely to be together in the same class than is the practice in most schools, and because this form of organisation resembles a supportive family environment, the organisation is also called "family grouping". Multi-age grouping is also associated with cooperative teaching, with most classes working in double teaching spaces with two teachers responsible for the larger group. Most students will have the same teachers for two or three years in succession.[59]

Another area of innovation is the school's commitment to environmental education with many classroom activities and school community events often having an environmental focus. Each year in July, for example, the school organises a "Koalathon", a sponsored walk from the school to the Daisy Hill State Forest to raise funds for the Australian Koala Foundation. This whole school event involves students, parents, grandparents, past students and past parents and many other members of the local community.

[59] Information from the Fernwood State School Prospectus (1999).

The school also has a *Birds and Trees Project Club*, run largely by students with the support of Jo, a key participant in this action research project, and a classroom teacher who works mainly with upper primary grades. This *Project Club*, with the motto "Learning by Doing", commenced in 1986 primarily for students in Jo's class, and focuses on maintaining and developing gardens and habitats within the school, especially the club's major project – the development of a rainforest habitat. Over the years, students have also established frog-breeding as well as breeding endangered native finches and quail; they run a composting program and propagate native plants; they have extended the koala habitat through the school and organise recycling projects. These activities have been recognised with several state and national awards. These include the 1992 *World Environment Day Youth Award* (state winner) and the 1992 *Earthworm* awards, initiated by the Australian Science Teachers' Association (state and national winners). In 1996, the Club won a national *Readers' Digest 50th Anniversary Award for Environmental Endeavour*.[60]

The success of these *Project Club* activities eventually led to the whole school becoming involved in environmental education projects. In 1993, with the support and leadership of a team of three (the principal, the *Project Club* facilitator, and a teacher in the Year 1/2 family group) the whole school committed itself to an *Earthworm* project. Bushfire and koala endangerment became the central theme, which was designed to promote extensive classroom, school and community involvement. In every year that entries have been submitted, the school has won state *Earthworm* awards and also won the national award in 1994. In addition to these projects, the school also participates in environment-related projects such as *Cash-for-Cans*, a recycling project, and *Tidy Schools*. In 2001, the school was regional winner of the Comalco *Green and Healthy* Award for schools.

In 1994, in part due to its commitment to environmental projects and environmental education,[61] and its strong community "outreach" orientation, the school was asked to apply for, and received, a large grant from the state Department of Environment for grounds redevelopment to further enhance its environmental education activities. After much consultation within and beyond the school community, the school was able to extensively redevelop its grounds in 1996. The concept behind these developments was "learnscaping".

[60] Information from the School Prospectus and website (2000): http://www.schools.ash.org.au/chss/
[61] This was also at the time of a state election. The school was in a marginal electorate that was angered over plans by the (then) government to build a freeway through the koala corridor.

LEARNSCAPING: GROUNDS FOR LEARNING

Learnscaping is a strategy that integrates a school's landscapes and teaching and learning. It locates students' and teachers' experiences of the outdoors within the immediacy of the school environment. While the term learnscaping has emerged specifically within Australian environmental education circles (Smith, 1998), it is an element in the broader process of "ecologisation of schools" (Rauch, 2000). This is a process becoming adopted across the globe as a way of providing nature experiences for students, of supporting environmental education and of enhancing and making the most of a school's outdoor assets. By 1997, in the United Kingdom for example, the *Learning Through Landscapes* movement is credited with improving at least one-third of Britain's 30 000 schoolyards. In the early 1990s, this movement also provided impetus for the development of learnscaping in Australia. This organisation also inspired a national program in Canada, called *Learning Grounds*, sponsored by the Evergreen Foundation, and a program called *Skolans Uterum* in Sweden. In the United States, the *Schoolyard Habitat* movement has emerged in similar vein, with the ambitious task of helping its schools "green their grounds" (Rivkin, 1997).

According to Lucas (1997) the value of utilising schoolgrounds as settings for environmental learning derives from the notion that, for most children, schoolgrounds are the first public outdoor space with which they have any sustained experience. Indeed, he maintains that schoolgrounds are the one outdoor environment to which all children have regular access, and that they are increasingly the *only* outdoor environments to which some children routinely have access. Rivkin (1997) reinforces this view commenting that, for many children, even preschool and school-based opportunities for outside play have become "endangered". By creating "outdoor classrooms", learnscaping provides both the physical sites for play, learning and teaching, as well as stimuli, props and resources for such activities. Furthermore, learnscaping provides opportunities for schools to take "action" locally, and to demonstrate commitment to educating for sustainability, by making learning meaningful in this most familiar of environments (Cox, 1992; Harwood Island Public School, 1996; Lucas, 1997). While it is undoubtedly important to protect forests and national parks, it is perhaps more meaningful to students to protect and enhance the places where they have close and regular involvement with nature (Hart, 1997). Relevant, everyday issues and problems in the schoolgrounds such as litter, erosion, habitat degradation, and even vandalism, can become the basis for significant student investigation, inquiry and action. In the schoolyard, the benefits of environmental actions go directly and obviously to those who use the grounds, particularly the school students themselves.

It must be emphasised, however, that while designing and creating learnscapes can be powerful educative experiences, schoolgrounds are not learnscaped until learning experiences are purposefully designed for them (Harwood Island Public School, 1996). A "true" learnscape, according to Smith (2000) should have the following criteria: ecological sustainability of the grounds; direct reference to syllabus documents; is an integrated and permanent part of the school plan; and serves as a vehicle for resolving a local environmental problem. Through application of these criteria, schoolgrounds become springboards for meaningful learning – both environmental and integrated learning across a range of key learning areas (Smith, 2000).

These principles have been expanded upon by Rauch (2000) in her recent review of literature about the "ecologisation of schools" in Europe, a process akin to learnscaping. This review identified a number of quality features of ecologisation, central of which was the view that it challenges school structures and processes, and therefore requires new forms of teaching and learning. These features are as follows:

- it provides comprehensive and integrated projects as part of teaching and learning;
- it provides action-oriented and reflective forms of pedagogy where students learn actively and take responsibility for shaping things or processes;
- it is characterised by communication, cooperation and teamwork of all players where schools see themselves as learning organisations;
- it is subject to continuing on-site evaluation;
- it is supported, both materially and through non-material support, including a supportive principal, external experts, internal support staff, and opportunities to exchange experiences;
- it develops constructive relationships with the local community or neighbourhood, with the school seen as a place of teaching and learning for the whole community.

Of course, the potential of ecologisation and learnscaping has yet to be realised; these concepts are, after all, relatively new. However, it is obvious that they offer much more than direct contact with nature or opportunities for outdoor learning. The potential is for an holistic, critical approach to environmental education, with comprehensive processes that have the potential to guide broader changes in school, curriculum and pedagogy.

The Fernwood Learnscape Circuit

As a result of the funding support from the Department of Environment, the grounds and gardens at Fernwood State School were extensively "learnscaped" (really only "landscaped" at this early stage). This process took two years and was completed in late 1998 with the active assistance of parents and teachers. As a result, a *Learnscape Circuit* (Figure 3.3) was developed comprising the following themed gardens:

- Colour and Scent Garden;
- Line and Texture Garden;
- Shape Garden;
- Growing Garden (the shadehouse);
- Koala Corridor;
- Rainforest Garden (established and maintained by the *Project Club*);
- Habitat Garden (established and maintained by the *Project Club*); and
- Aboriginal Food/Use Garden.

Figure 3.3. Map of the school's Learnscape Circuit.

It was just after the official opening of the Learnscape Circuit in late 1996, that my involvement with the school commenced. The "ground" work had been completed and the school was looking to move into the next phase. Consequently, I was approached by a

teacher at the school whom I knew through mutual membership of a professional network,[62] as to whether I would be interested in assisting with the development of a learnscaping curriculum for integrating the grounds and gardens into the everyday learning and teaching experiences of the school. As the proposal lay in my field of professional interest, and as I was beginning to explore possibilities for doctoral study at this time, this offer was persuasive. After some inquiries and discussions, I decided to commit to this project.

OVERVIEW AND EVOLUTION OF THIS ACTION RESEARCH PROJECT

In this next section, I provide an overview of how this study proceeded from this initial starting point. It is important to re-emphasise that this project was not designed in advance, a significant departure from conventional research processes. Rather, the research processes and outcomes *evolved* in response to the changing setting, and the emerging and changing needs of, and everyday demands on, participants. Only on looking back did it become apparent that there were three distinct cycles, each with a number of phases, constituting the larger study. Figure 3.4 gives a "snapshot" of the action research cycles and phases making up this curriculum development project while Figure 3.5 details how these cycles and phases corresponded with the major research processes utilised in this study. It must be reiterated, however, that the overall research process was much "fuzzier" and more "out of control" than the orderly views depicted in these diagrams. The next three chapters describe and analyse these three cycles in detail.

As I outlined in chapter 1, this study has been just one stage of a much larger and longer program of environmental education[63] begun over a decade ago at the school. Prior to the commencement of this action research in 1997, the school was already involved in a range of environmental educational initiatives as well as the landscaping project upon which the learnscaping curriculum project was based. These early activities constitute Stage 1. The action research study that formed the basis of this thesis is Stage 2. The third stage of the project, beyond the scope of this study, relates to the implementation of the learnscaping curriculum into the school's day-to-day teaching and learning, and ongoing curriculum evaluation, renewal and dissemination strategies.

In Stage 2, there were three action research cycles, as illustrated in Figure 3.4. These cycles led to the collaborative development of the learnscaping curriculum and the document

[62] In late 1995 I co-founded the Queensland Early Childhood Environmental Education Network to support those in the early childhood education field with an interest in environmental education.
[63] See Figure 1.2.

Learnscapes Alive. Cycle 1, *Getting Started,* was largely concerned with determining the nature and purpose of the study, the establishment of working relationships with staff at the school, and developing an understanding of the school context. It also included a "first run" in developing learnscaping materials. Cycle 2, which I called *Down to Work,* saw the development of proposals for action, their implementation, and led to the collaborative writing of the first draft of the learnscaping manual. Cycle 3, *The Never Ending Story,* denotes the slowly-paced "finishing off" period of the study. As Figure 3.4 also illustrates, there were a number of phases within each of the three cycles.

Figure 3.5 outlines these phases within the cycle in detail. These phases constitute the various research events or processes that evolved, or were designed, as the study proceeded. For each of the phases, a range of qualitative research tools were used, both to gather data for analysis and to create the data needed to sustain the ongoing research. In particular, participant observation, journal writing, interview and conversation were significant data generating and data gathering tools used throughout the study. Figure 3.5 also shows the areas of literature that were explored within each cycle, both in relation to the "content" of the study and in terms of research processes. In Cycle 1, for example, there was a strong focus on literature concerned with environmental education, particularly as it related to schools. This provided me with ideas and perspectives that helped in critiquing existing environmental education activities in the school and in making suggestions and proposals for future developments. At the same time, because I was already actively engaged in the study, I was also reading and reviewing literature concerned with the conduct of action research, ways to gather and generate the data in the study, and deepening my understanding of ethical issues in action research.[64] Especially in this first cycle, the gap between reading the literature and then putting ideas into practice was often very short. At times the actions preceded the reading and review.

[64] These issues are detailed in the following chapters where I coverage the conduct of the research.

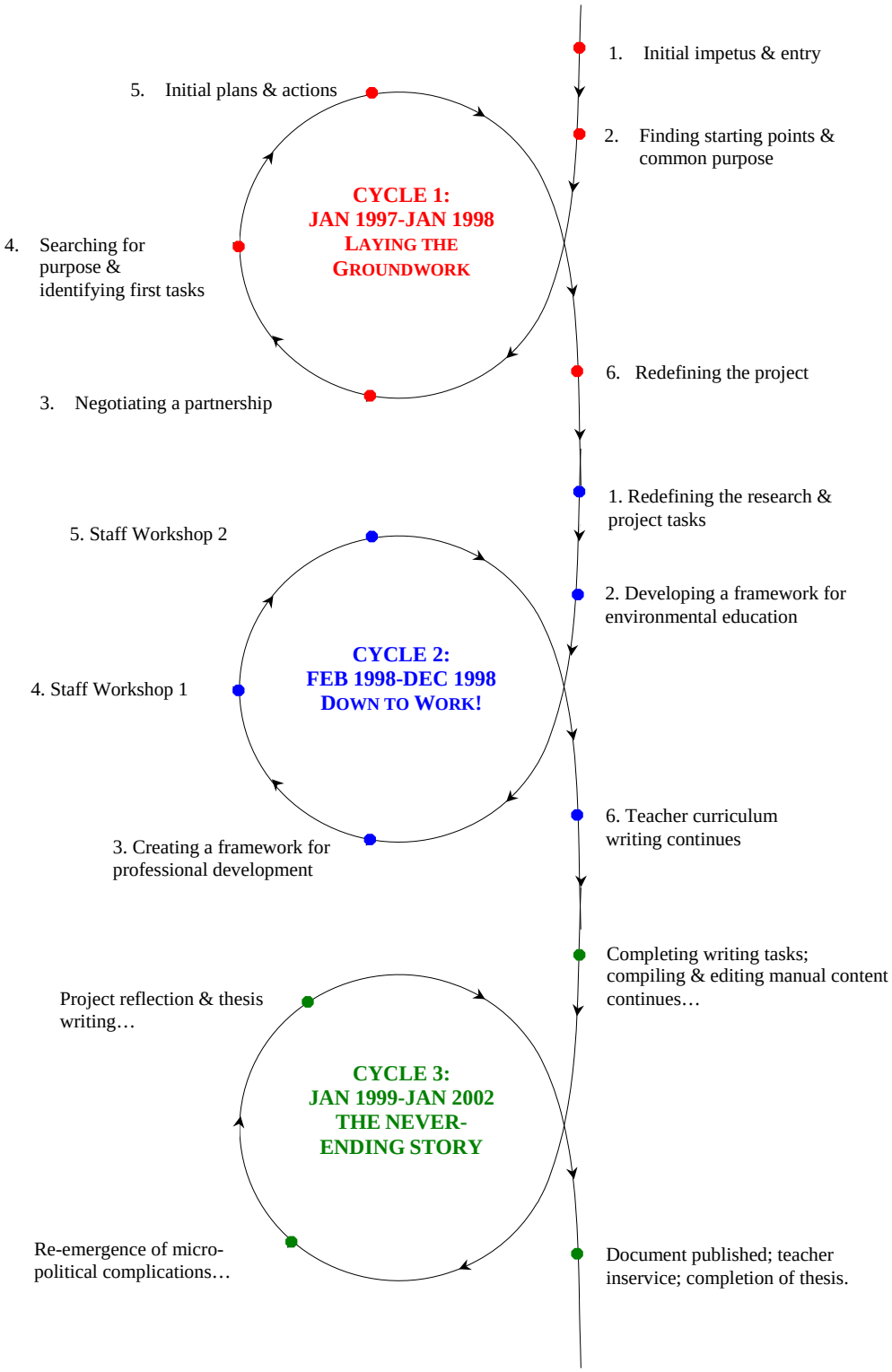

Figure 3.4 The three action research cycles and their phases.

In Cycle 2, the phases were concerned with the development of workshops for teachers to support their involvement in learnscaping curriculum writing, and with the compilation of their work into a learnscaping manual for later use. As in Cycle 1, the qualitative data gathering tools of observation, interview, journal writing and conversation, complemented by email discussion and document analysis, were used extensively. Literature review extended upon, and deepened, what was undertaken in Cycle 1. In particular, there was a focus on learning about implementing environmental education at the whole school level, and about integrated curriculum approaches. Because a need for teacher professional development in environmental education had become apparent, I also examined general literature on this topic. In terms of literature about the conduct of research, new areas of focus included data management and analysis, as well as an exploration of ethical and procedural issues with action research facilitation.

Hence, the research tools of significance in this phase continued to be participant observation, conservation and email discussion. In addition, the process of writing this report added extra opportunities for review and reflection on the study overall. In particular, I explored new areas of literature about change theory, chaos/complexity theory and school and curriculum change during this period, because of the frustrating delays in getting the curriculum materials to publication. These inquiries helped in the development of insights and perspectives about the project, and about educational change more generally, that would not have arisen had the project proceeded as anticipated. In terms of the research processes involved in this cycle, there was continued data collection, analysis and interpretation. However, the bulk of my efforts during this cycle concerned the preparation and presentation of this thesis. This involved a major investigation into alternative approaches to structuring and reporting action research and reorganising the structure of this thesis to better reflect the study's evolution.

	Action phases	Research techniques used to generate research knowledge	Review of literature related to the project content	Research processes & areas of literature related to the conduct of this study
CYCLE 1 **Laying the Groundwork** **Jan 1997-Jan 1998**	**1. Initial impetus and entry** **2. Finding starting points & common purpose** **3. Negotiating a partnership** **4. Searching for purpose and identifying first tasks** **5. Initial plans and actions** **6. Redefining the project**	Participant observation Conversation School document collection and initial analysis Meeting notes Journal writing and analysis Interviews and transcriptions with key participants Reflection	Environmental education in schools Education for sustainability School change Development of environmental education curriculum Case studies in whole school curriculum change Micro-politics of schools	Research paradigms and methodologies Action research/case study Ethical issues in the conduct of research Environmental education research Conducting interviewing/transcription Writing diaries/journals Facilitation/ leadership in action research
CYCLE 2 **Down to Work!** **Feb 1998-Dec 1998**	**1. Redefining research and project tasks** **2. Developing a framework for environmental education** **3. Creating a framework for professional development in learnscaping** **4. Staff Workshop 1** **5. Staff Workshop 2** **6. Teacher curriculum writing**	Participant observation Interviews with key participants Focus group interviews Email discussion Conversation School document collection and analysis Meeting notes Diary writing and analysis Reflection	Whole school environmental education Integrated curriculum Learnscaping/outdoor classrooms Whole school change Teacher professional development approaches	Data collection and management Data analysis and interpretation techniques Facilitation and leadership in action research Collaborative practice in action research
CYCLE 3 **The Never Ending Story** **Jan 1999-Jan 2002**	**Completing writing tasks, compiling and editing manual content continues** **Re-emergence of micro-political complications** **Project reflection and thesis writing** **Publishing the manual; teacher inservice; completion of thesis.**	Participant observation Preparing content for project document Report writing Conversation Email discussion Reflection	Change theory Chaos/complexity theory Educational/school change	Continued data collection, analysis and interpretation Writing the literature review Structuring/restructuring thesis Thesis writing

Figure 3.5. Diagram showing the evolution and research strategies of this action research study.

CHAPTER SUMMARY

In this chapter I have articulated the key processes that influenced and guided this research journey. The first section outlined the purposes of this research project and identifies my philosophical standpoint as a researcher. I disclosed that I have adopted a critical and emancipatory methodological approach as the guiding framework for this research journey because, in a practical way, I wanted to directly address my concerns about the sustainability of the planet. From this stance, the choice of action research as the method of inquiry for this study was made relatively easily, due to the linkage of research and change into one process. This section also identified the two forms of emancipatory action research utilised in this study – the collaborative approach and the individual action research process aiding the development of my living educational theory.

The second part of the chapter discussed key methodological issues and dilemmas that had to be considered during the study. In particular, dilemmas associated with power and authority in teacher-researcher relationships, the multiple roles of the action researcher and issues with building trust in participatory research were explored. Questions of research rigour and validity in "new paradigm research" were also examined. This section also discussed the research techniques used in this research, explaining how data was gathered, recorded and organised and how it was analysed, interpreted and reported.

The third part of this chapter provided an overview of the school context, and the background and evolution of this study. There was a snapshot of the school's physical and social features, as well as highlights of its history of environmental and educational innovation. The chapter concluded with a diagram and table showing how the study evolved through its three action cycles and related phases. Collectively, the discussions of this chapter showed the extensive range of methodological and contextual considerations that have shaped this action research. It is the place of the next three chapters to illustrate how the study operated in practice.

IN THE FIELD

The first two chapters of this thesis represented the starting points for this research. In chapter 1, I outlined the concerns that motivated this study and articulated the objectives that developed in response to these concerns. I also provided a brief overview of the research approach and the study context. Chapter 2 provided an initial review of literature illustrating the environmental challenges facing the global community and explaining the need for environmental education. In chapter 3, I discussed the methodological approach of this study, the rationale for selecting critical action research, and the research techniques used to gather and analyse data. The chapter concluded with an overview of the research context and an outline of this study's evolution.

Part 2 of this thesis contains three chapters, each related to an "action" cycle, and reports the "fieldwork" component of this study. This is a narrative account of how the research "story" unfolded and how new knowledge was created through reflection, planning and action, to develop subsequent parts of the study. These chapters also trace the development of a series of central arguments and propositions about school change and innovation, environmental education and action research.

The three fieldwork chapters in Part 2 have a common three-part structure. The first part of each chapter provides a narrative account of the phases in the action research cycle, and includes discussion of the data collection and analysis processes and protocols that applied in each phase, together with my analyses and reflections on the phases. The second part reviews a major area of related literature explored in parallel with the fieldwork in each cycle, and could be scanned at this stage to provide an overview. These reviews are located within these chapters, rather than in a separate literature review chapter, to reinforce the linkage between theory and practice in the conduct of this action research study. The third part of each chapter provides a meta-analysis of the cycle in the light of what was learned from both fieldwork and literature.

This approach to reporting action research is supported by Dick (1993) and Elliott (1994). Both authors are critical of the practice of simply reporting the "findings" of action research detached from accounts of research process. This study therefore provides an integrated account of process, problems, outcomes and emerging research conclusions – with each of the cycle chapters providing a mixture of narrative about the project, discussion of research process, and critique of outcomes. This approach reflects the way in which project facilitation, data gathering, literature review and reflection were concurrent and interwoven research processes rather than separate, linear ones.

Chapter 4: Learning in the First Cycle
Laying the Groundwork

INTRODUCTION

The first cycle of action research took twelve months and focused on "laying the groundwork" for the curriculum actions of the next two cycles. While there were some small-scale curriculum actions in this first cycle, this was primarily a time for developing shared understandings about the school, for building relationships with key participants, and for clarifying the aims and processes of the study. Some initial theorising about facilitating educational change, environmental education, and the conduct of action research in schools began to emerge during this time and became the basis for deeper study and reflection in Cycles 2 and 3.

CYCLE 1: LAYING THE GROUNDWORK

Figure 4.1 provides a traveller's "snapshot" of the six key phases of Cycle 1, identifying preparatory processes and early events that underpinned this action research project. The diagram also illustrates that Cycle 1 sought to problematise the research situation. The phases in this cycle helped develop both practical data to guide subsequent cycles of this collaborative project, as well as create the basis for building my living educational theory about school and curriculum change.

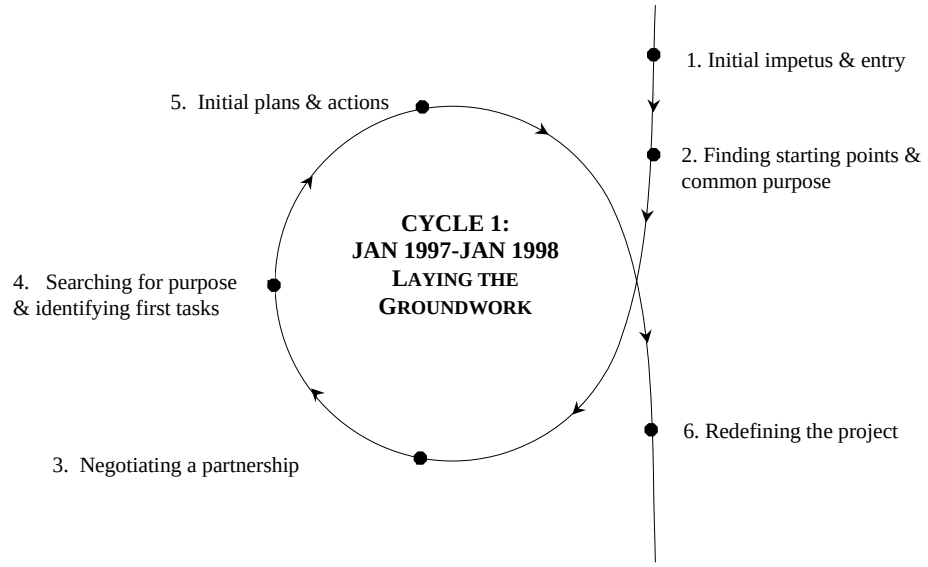

Figure 4.1. The six phases of the first cycle of this action research.

PHASE 1: INITIAL IMPETUS AND ENTRY INTO THE PROJECT (DEC 1996)

My involvement in this project began in late 1996. A teacher, Ann, from Fernwood State School, with whom I already had a professional acquaintance, asked whether I would consider assisting with the curriculum development phase of a learnscaping project. This request coincided with my initial explorations of a doctoral topic on whole school planning in environmental education. I therefore agreed to talk with the school's principal to ascertain whether our two sets of goals – their curriculum project and my research project – could be developed in a complementary way. The principal and I agreed that this was possible, with action research adopted as the research method because of its potential for generating a collaborative, needs-based process for curriculum development and for generating sufficient data for a doctoral thesis. After some early concerns about how I would manage these two significant research processes simultaneously, I committed to the school's project as a researcher-facilitator.

Reflection

> *The implications of running a concurrent field project and a PhD project were not lost on me. An awesome challenge was presented in learning about action research, getting to know and understand the context and people, facilitating the collaborative development of whole school curricula, as well as planning a personal PhD process. I could not ask the school to "hold off" on their project while I "got up to speed", though. In realtime action research, it's a matter of making the most of an opportunity, as and when it arises, knowing that the processes will always be a bit chaotic.* (Reflective Journal, Cycle 1, 15/1/97)

PHASE 2: FINDING STARTING POINTS AND PURPOSES (DEC 1996-JAN 1997)

I used the summer vacation to consider what I really wanted to investigate in the project. I drew on my previous experience of facilitating an educational change project,[65] and from literature on school change and innovation[66] and school-based environmental education,[67] to help formulate guiding questions as broad starting points for this inquiry. These were:

- *What are the characteristics of transformational education and how can education be reoriented for sustainability?*
- *How can critical environmental education be implemented in schools?*
- *What are the constraints and opportunities for school-based critical environmental education and how can these inquiries guide action research at Fernwood State School?*

[65] This is outlined in Davis and Cooke (1998) *Parents as Partners in Educational Change: The Ashgrove Healthy School Environment Project.*
[66] Initial authors consulted included Fullan (1993), Fullan (1997), Hargreaves (1997).
[67] These included Gough (1992), Qld Dept of Education (1993), Smith and Coad (1996).

These were what Dick (1993) calls the initial "fuzzy questions" of action research. I sought to refine these as the study proceeded and to uncover their "fuzzy" answers.

Reflections and Propositions about School Change and Innovation

These broad questions partly reflected my existing ideas about, and interest in, educational and school reform developed over twenty-five years of reading and experience in education as a teacher, parent and teacher educator. In this new study I was seeking to further develop my personal theorising around these questions, updating my theories by reference to recent research literature, as well as by confirming these theories in practice. Thus, at the start of the study, I already supported the following propositions about educational change:[68]

- *Whole school change is the most successful*;
  Educational change and innovation has to be broadly based. Individuals may initiate innovations, but these are unlikely to be embedded and sustained into day-to-day practices without widespread support and commitment to the changes.

- *Democratic ownership, leadership and relationships are vital for guiding and committing participants to change*;
  "Top-down" approaches have limited success in changing teachers' practices. Innovation built upon the priorities of teachers, and where they are co-learners and co-developers of the changes, leads to more powerful and sustainable forms of change (Fullan, 1993, 1999; Hargreaves, 1997; Ball, 1987).

- *Strong connections are indicated between curriculum development, professional development and educational research*;
  Participatory approaches that explicitly link curriculum development, teacher professional development and research are recognised as important ways of creating (environmental) educational innovation and change (Fullan, 1993; Gunter, 1997; Hargreaves, 1997; Hart, Taylor, & Robottom, 1994 ; Robottom and Hart, 1993)

- *Changes are more likely to be sustained if committed into policy and planning*;
  Lasting innovation needs to be embedded into the school's mission or central purpose. This makes it clear to all that it is a highly valued facet of school life. Through well-articulated and oft-repeated statements and policy related to the innovation, the need for constant justification for time and resources is circumvented.

[68] These were first articulated in my PhD research proposal, January 1997.

Focused Research Tasks

From these broad questions and initial propositions, I developed a contextualised research plan that evolved into two research tasks. These were:

1. *The development of a narrative about an environmental education innovation*; This provides the story of the action research project. Detailed documentation of the evolution of a project may lead to better understanding of what contributes to or hinders (environmental education) innovation in schools.

2. *The development of critical understanding of the processes and outcomes of the action research project by*:
    - identifying enabling factors and barriers that influence the development of an environmental education curriculum innovation,
    - assessing the curriculum outcomes,
    - assessing significant and problematic aspects of the processes of change, especially my role as researcher/facilitator,
    - developing living educational theory about school and curriculum change.

These are important tasks because they can help explain the nature of the gaps between the rhetoric and realities of environmental education in schools (Robertson & Krugly-Smolska, 1997; Stevenson, 1987). By paying attention to what *is working* and why (Raffan, 1990, p. 49), this study may contribute to both improved practice and enhanced theorising in environmental education.

PHASE 3: NEGOTIATING A PARTNERSHIP (JAN-FEB 1997)

In this phase the following questions guided my interactions with the school:

- *Who are the key people in this project?*
- *How will we work together?*

As had been arranged with the principal at the end of 1996, I met Ann and Jo, the two key environmental education teachers in the school, on the pupil-free day[69] at the beginning of

[69] Teachers have two days without students at the start of Term 1 to attend meetings, consult with peers, engage in professional development or teaching preparation.

the 1997 school year to discuss the proposed project.[70] For this meeting, I assembled a range of resources on environmental education,[71] as well as an article on the use of storytelling and developing a "storythread" as a means of creating across-the-curriculum approaches based on schoolground learning.[72] These articles provided starting points for a discussion that gave me some initial appreciation of teachers' understandings of environmental education. At home, after this meeting, I wrote a summary of my understandings of the project based on these discussions, developed a draft framework and timetable, and proposed some subsequent planning steps. I then posted these materials to the school for their consideration, along with some additional printed resources,[73] to enable "shared understanding" of concepts and processes raised during the meeting. These interactions were the beginnings of establishing an informal contract in relation to this project.

Research Protocols and Processes

Immediately after this meeting, I wrote my first field notes. These contained my early reflections about how environmental education was practiced in the school and the record of discussion arising from the materials posted after the first meeting. These items proved useful for guiding my next interactions with the teachers. These notes, and subsequent discussion derived from their content, also offered a way of "member-checking"[74] with the teachers, helping to align our understandings of the purposes of the project and how it might proceed.

Analysis and Reflection

This initial meeting provided situational data that proved to be of continuing importance throughout the life of the project. In summary this meeting revealed that:

- *There was little knowledge of environmental education approaches, as defined by the field of environmental education, despite longstanding involvement with environmental projects;*
- *The teachers understood that children's ownership of the school's gardens and landscapes was crucial, especially if students were to be motivated to look after them;*
- *It was understood that current environmental education initiatives were ad hoc, and that the school needed to address this;*

[70] These names are pseudonyms providing anonymity for respondents, especially in light of the sensitive nature of some comments and commentary.
[71] This included the "official" *P-12 Environmental Education Curriculum Guide* (Dept of Education, 1993).
[72] This was Thomson's (1996) *Discovery and Learning: An investigation into the social and environmental awareness in a primary school*, a case study of a Scottish primary school project linking storytelling and environmental education.
[73] These included a summary sheet about action research to help explain the process, and a two-page handout outlining current approaches to environmental education and the potential of learnscaping.
[74] See chapter 3 for discussion of issues and strategies associated with validity in action research.

- *Teachers wanted/needed the help of an environmental education "expert" as they did not feel they had the knowledge and strategies to develop learnscaping curriculum;*

- *Science was the preferred subject of the upper school key teacher. This meant that there was a strong Science orientation to environmental education, overall. However, Arts curriculum was quite strong in the lower school. I believe these options might offer alternative entry points into the project;*

- *Social Studies was not seen as having much to offer environmental education.*

(Meeting notes, Cycle 1, 13/2/97)

PHASE 4: SEARCHING FOR PURPOSE AND IDENTIFYING FIRST TASKS (TERM 1, 1997)

After my first meetings, discussions and reflections, the research problem was beginning to be slightly "less fuzzy" than at the start. Consequently, new guiding questions were developed, these becoming more focused than the previous ones:

- *What do I need to know about the school and its curriculum practices?*

- *What is the nature of the curriculum "problem" we are seeking to address?*

- *How do we address this problem?*

A key task for me was to develop knowledge of the school context, form relationships with key individuals, negotiate roles, and clarify the research focus and approach. Early discussions led me to understand that the project was the development of a learnscaping curriculum as part of a school-wide environmental education framework. My self-assigned research tasks during this first term were to learn more, in a general way, about the school and its community, build relationships with staff and find out how environmental education was implemented in the school. I also began researching and acquiring general resources about school-based environmental education, learnscaping, whole school approaches to environmental education. I also searched for useful case studies of similar projects.

While I attended to these tasks, Jo and the rest of the staff were discussing the school's *Earthworm Project* for Term 2. Jo suggested it be based on the learnscaping concept and this was agreed to. As I was invited to attend some initial meetings of the planning group, I raised the idea of using story, as in the article previously discussed with Jo and Ann, as an integrating, cross-curricular strategy that could link the gardens with the classroom learning. Jo appeared hesitant about this idea at first (perhaps because she was more comfortable with a science-oriented focus) but the other teachers warmed to the possibilities. Consequently, it was decided that classes would commence story writing

activities before the end of Term 1, with additional learnscaping activities to be developed and implemented in Terms 2 and 3 as the *Earthworm Project* proceeded.

Research Protocols and Processes

Most of my visits to the school involved meeting with Jo and/or Ann. These were often short and rushed, sandwiched between their classroom duties and other commitments. There was little opportunity to meet other staff, although I made the most of casual opportunities during morning tea and lunch breaks, or while moving from one meeting place to another. Occasionally there were opportunities to have a more extended conversation with one or other of the key people.

I became a participant observer[75] the moment I arrived at the school, alert to informal data sources such as conversations-in-passing, as well as gathering data in "official" meetings. I found the most useful way of recording data was to make brief notes during meetings; then, in my car prior to leaving the school, to record other significant information, conversations and impressions. These meeting notes and field notes were later integrated into detailed notes and journal reflections. I used these reflections to raise issues and ideas at subsequent meetings as well as to identify new resources and proposals for action. Each new meeting was also a dialectic,[76] an opportunity for member-checking with participants, to validate my interpretations of the data, to provide opportunities for further exploration of ideas and issues, and to aid in the development of new ideas, plans and action.

Analyses and Reflections

Two key issues emerged from these early meetings. The first concerned the busy nature of teachers' work, foreshadowing its later impact on the study. After one of these early meetings with Ann, Jo and an early childhood teacher, I wrote:

> *I only had 30 minutes to show and share the resources and we went flat out. I'm left with the feeling that it is a miracle that anything changes in schools, as teachers' time is so packed dealing with the compelling issues of day-to-day: playground duty, lost lunches, grazed knees, a quick bite or cup of coffee, organising details of the next session etc. Who wants to plan for next term, let alone next year or for the next generation when the needs of the next 1/2-hour are so pressing?* (Reflective journal, Cycle, 13/3/97)

The second issue related to project participation, especially for students, the broad group of teachers in the school, and parents. The following extracts from my meeting notes illustrate my queries and uncertainties about this:

[75] This research role is discussed in chapter 3.
[76] This process of validation is discussed in chapter 3.

> *The issue of ownership is emerging as a central theme, particularly related to the process by which the story is to be developed. The idea is to build a story for the school as the means of linking the gardens with environmental concepts. Ann raised the question of who writes the story. Jo thought the upper school children could write this initially and then present the story to other year levels for them to redevelop. Other teachers thought differently as they wanted maximum child participation and ownership.* (Meeting notes, Cycle1, 13/2/97)

This excerpt also illustrates the spectrum of views about ways to be inclusive. When "time" is also a constraining factor, dilemmas are exacerbated. "Past practice" becomes a comfortable solution:

> *Full and open participation in decision-making takes time. However, when there are short time-lines and a busy overall pace to school life, there is a danger that decisions end up being centrally made. To an outsider, it seems that teachers who are expected to engage in implementing new curriculum strategies are not really given opportunities for full commitment and involvement. When I discussed this with Jo and Ann, however, Jo commented that "There have been no mutinies". These two teachers have run the Earthworm Project over the past few years, more or less, and it is apparent that they are well respected for their commitment, ideas and leadership. Overall, the teachers appear to be "onside" and quite committed to the school's Earthworm activities and the environmental focus of the school generally.* (Meeting notes, Cycle1, 13/2/97)

However, from my initial observations, I identified parents as a group that seemed to be outside the decision-making processes, with their role being one of support rather than deep involvement. As I wrote in my journal in these early days:

> *Parents? Fairly invisible so far and not involved in any of the curriculum planning, though a couple of parents have been approached by the principal to become involved in the garden maintenance. Parents were also mentioned as being able to help with the quilt making.* (Meeting notes, Cycle 1, 13/2/97)

Another aspect about participation that raised a query concerned perceptions of my level of involvement. I was initially apprehensive that I would be seen as the "environmental education expert", a role that gave too much authority to my suggestions and advice, and that would limit others' participation. The following journal entry elaborates this concern:

> *I left the very first meeting feeling that Jo and Ann saw me as the "expert" with all the ideas about learnscaping and environmental education. However, I have begun to detect a change. In the space of three weeks, they have taken command of the project. I would like to think that this is because I have emphasised the idea of the project needing to be owned by the school, and that I am just a facilitator in a process, not an "expert" who wants to run it.* (Meeting notes, Cycle 1, 13/2/97)

Overall, Term 1 had been a valuable period of observation and project facilitation. It enabled me to focus on important interpersonal dynamics and processes of decision-making. These valuable insights proved useful in interpreting subsequent events and issues that emerged as the project proceeded and are discussed later in this chapter.

PHASE 5: INITIAL PLANS AND ACTIONS: *EARTHWORM 1997* (TERM 2, 1997)

The fifth phase of Cycle 1 focused on the first plans and actions in the learnscaping project. The guiding question for this phase was:

- *What can we learn from practice?*

Term 2 saw the full development and implementation of *1997 Earthworm Project*, which had the theme *What's Outside The Door?* The overall objective of "turning our landscaping into learnscaping"[77] became a multi-faceted project with a number of whole school sub-projects. These included: the creation of a school story based on the gardens; the creation of "care" quilts;[78] participation in an aluminium can recycling project called *Target Two Tonne*; and a competition for classes to propagate the seeds of local or endangered plant species for replanting at home. Teachers also worked with their family groups to create a range of themed curriculum units. The early childhood family group, for example, created an integrated unit on "Birds" that linked class activities with the Colour and Scent Garden. An *Under Eight's Week* celebration was also held involving a range of outdoor, play-based learning activities for younger children in the school and preschool.

My role as a facilitator in this 1997 *Earthworm Project* was relatively minor, mainly involving the initial suggestion of using storytelling as an integrating device. Mostly, I was an observer of what was already underway. Creation of the stories involved a professional storyteller (Figure 4.2) who visited each family group twice to facilitate a range of stories that connected students with their allocated gardens[79] in the learnscaping circuit. He then edited these into "chapters" based on the stories of the lower, middle and upper student groups. Finally, these chapters were woven together around a "problem" and "resolution" to create an effective and vibrant storytelling experience. An appealing feature was that the stories were to be "passed on" in subsequent years, so that "the stories could endure" (quote from principal, Reflective journal, Cycle 1, 18/4/97). His hope was that ownership and stewardship of the gardens would be reinforced not only through students' positive experiences in the school environment but also through the stories told about the gardens.

[77] This phrase came from Jo's draft plans for the 1997 *Earthworm Project*, presented to staff in Term 1.
[78] The idea was for classes and the wider community to make large display quilts from many individual patches. These were later donated to Ronald McDonald House at The Royal Brisbane Children's Hospital, to reflect the school's commitment to social, as well as environmental, responsibility.
[79] For example, children in the Year 1/2 family group were allocated the "Colour and Scent" garden, just outside their classroom, as their "care" garden with responsibility for maintaining and caring this garden. This section of the learnscape circuit was also a focus for integrated outdoor and environmental education curriculum activities, including the development of their class story.

Figure 4.2 The storyteller in action.

Research Protocols and Processes

As the project developed, the roles of participants became more explicit with Jo and Ann assuming greater leadership of the project than in early stages. With minimal input into the *Earthworm Project*, I concentrated on my observational and data collection roles. In particular, I recorded significant events, situations and impressions in my journal; took photographs; recorded meetings; and offered reports back to Ann and Jo (although these were mostly in the form of informal conversation rather than "hard copy").

However, I also acted as "mobiliser" for the overall learnscaping project, being especially keen to keep interest in this, even though the *Earthworm Project* was the current focus of the school. This was expedited when an email link between Jo and me was established. This made it much easier to arrange visits, and became a fast, new channel for communicating ideas and information and clarifying perceptions. The frequency and informality of email also helped to strengthen our personal connections.

I also began to act as "provocateur" for the learnscaping project as I sought to enhance teachers' knowledge of environmental education and the importance of critical, issues-based pedagogies. I did this by including content in our meetings that linked the learnscaping project to larger environmental issues. These issues included the need for wildlife corridors, the impact of urban development on biodiversity, as well as general issues of ecological sustainability. My intention was to provoke thought about these issues in the hope that they would also be perceived as curriculum issues.

I also continued in my role as resource person by collecting and distributing resource materials for teachers. These included children's picture books with environmental themes, case studies about whole school environmental education, articles about environmental education and environmental issues, and some internet websites that could be useful for

developing classroom activities. In addition, I arranged for a video segment on learnscaping to be filmed at the school.[80] I also passed on an invitation to Jo for the school's learnscaping project to be written up as a case study for an environmental education journal.[81]

I also formalised my position as a doctoral researcher during this period. I was very conscious of my status as an "outsider" – an academic and a researcher – and wished to ensure that the rights and sensitivities of school partners, who could be perceived as "weaker" members of the research partnership, were protected. As a result, I sent a letter to Ian, (Appendix B) that put matters about researcher rights and responsibilities in writing that until now had been a verbal "contract". In this letter, I also reaffirmed my anticipated role in the study and sought permission to conduct interviews with staff and parents.

After reconfirming these protocols I conducted the first two interviews of this study. The first was with the principal, in order to obtain background information regarding the school and his views about environmental education. The second was with the group of early childhood teachers who had developed the integrated unit of work on the "Birds" theme[82]. These interviews were also useful as a way of debriefing about the *Earthworm*/learnscaping activities that had just been conducted. The upcoming and overlapping school holidays and university inter-semester period provided an ideal opportunity for transcription, as well as some first level data analysis based upon a combination of realtime analysis, pattern searching and progressive focusing. I also had a "breathing space" from the regular, but time consuming, visits to the school. This provided opportunities to reflect on the events of the past semester and to apply my developing understandings to the next part of the project.

Analyses and Reflections

Three main themes emerged from this data analysis and reflection: a critique of the curriculum activities developed in the *Earthworm Project*; my changing and ambiguous role within the project; and the emerging need for professional development in environmental education, allied with an overall environmental education policy/framework.

The activities and sub-projects developed for the *Earthworm Project* became the first curriculum "actions" of this action research that were, in effect, a "trial run" for later learnscaping developments. Hence, they provided a valuable source of learning for the

[80] This became part of a video about educational innovation in Australia made for the de Bono Institute (1997) *Searching for Excellence: Profiles of quality and innovation in Australian schools.*
[81] This later appeared as a "Story from Practice" in the *Australian Journal of Environmental Education.*
[82] These teachers were selected for interview at this time because the unit of work they had developed was "fresh" and the teachers were keen to discuss what they had achieved.

actual learnscaping project and for future planning. These initiatives demonstrated that several teachers, especially those in the early childhood classes, were already competent planners of integrated curriculum. For example, their planning document based on the "Birds" theme revealed a unit of work focused on language education as well as activities in Science and Technology, Arts and Crafts, Music, Social Studies/Human Relationships Education and Mathematics. An outdoor investigation, called the *Five Star Garden* (Appendix I) was also included in these plans. This strategy encouraged the students to assess each of the gardens in the school's Learnscaping Circuit for their bird-friendliness and to make suggestions, then plan and implement actions to address shortcomings. Students were then encouraged to use this information to assess their home gardens. As the planning document stated, students were supported by their teachers to inquire into:

> *…the variety of birdlife in the schoolgrounds and surrounding areas to determine whether the school has "Five Star" status as a bird-friendly environment… and then create a local field guide and prepare posters for the local community shopping centre to promote the notion of "five star garden".* (Curriculum plans, Cycle 1, 24/3/97)

These plans revealed a high level of capacity for developing and implementing integrated, outdoor-oriented learning activities. They also showed that these teachers had the knowledge and capacity to support young children's investigations of a local environmental issue that required critical reflection and action. Indeed, it was obvious that many of these *Earthworm* activities and strategies provided strong beginnings for developing the "official" learnscaping curriculum. However, further observation and discussions with other teachers revealed that the skills of the early childhood teachers were not shared across all sections of the school. I also learnt that this issues-investigation was not regular curriculum practice in the early childhood classrooms.

It was the storytelling sub-project, however, that provided the best opportunity for me to observe and reflect on school-wide curriculum decision-making and practice. The purpose of the storytelling strategy was "to encourage care and ownership of the landscaping and its nine environmental gardens" and for the students "to have some part of them in it" (Reflective journal, Cycle 1, 18/4/97). However, the issue of how best to develop the story created considerable discussion amongst teachers. One option, preferred by Jo and Ian, was to develop a single story with three chapters as this was considered a "less messy" and less time consuming approach. Another suggestion was for three quite separate stories to be developed, one for each of the upper, middle and lower sections of the school. A stalemate appeared likely until the storyteller expressed his preferred view that the creation of three separate stories "would be more likely to build ownership for the children" (Reflective

journal, Cycle 1, 18/4/97). This convincing argument eventually overrode concerns about long timeframes and "messy" processes.

These discussions about how the story was to develop signified the centrality of the issue of children's ownership of learning, and related learning processes. There was no doubt that there was wide support amongst the teachers for students to have "ownership" both of the stories and of the gardens. Indeed, after observing the teachers, students and the storyteller in action, I believe the process that developed went a long way in support of this goal. Thus, at the end of the process, I wrote:

> *The children enjoyed making and hearing the stories and were engrossed in the tellings and retellings. This storytelling process has been a really effective device for helping the teachers and children make links to the gardens and the landscapes. This was because the stories involved the school's physical setting and real people in the school, such as the principal, groundsperson and some children in the classes, as well as koalas, noisy miners and other animals that frequent the school's gardens and habitats.* (Reflective journal, Cycle 1, 18/4/97)

However, "ownership" can be shallow and quixotic rather than genuine and, is perhaps best thought of as existing on a continuum rather than of being "present" or "not present."[83] For example, while there was a high level of student involvement in the process of creating the stories with the storyteller, the children were not consulted about the final selection of stories that became representative of each of the three sections of the school. This decision was a decisive "win" for structure and order at the expense of inclusivity and student ownership. I commented on this conundrum in my journal:

> *Jo and Ian were keen to have well-structured and orderly process, even if this meant "rejecting" some stories (Jo implied that there had to be winners and losers). Susan, however, wanted to be more inclusive of all children's ideas, to give value to them. Ian, I think, was locked into the "selective" process as he had already informed the school that only one "enduring story" would be developed. Susan, when she heard of the change of process, was obviously disappointed but knew a "fait accompli" when she heard one.* (Reflective journal, Cycle 1, 18/4/97)

The second point of reflection during this phase related to perceptions of my role in the project. I thought that I had dispelled the idea that I was the expert who would have the primary task of writing the learnscaping curriculum. However, I was surprised to receive an email from Jo while the *Earthworm Project* activities were underway, which stated:

> *You should now have a big rest… and let us potter around with all the kid-type things. I have a strong feeling that you will need your rest, because I think you will be very busy*

[83] Later, I discovered Roger Hart's "ladder of children's participation" (discussed later) which identified eight rungs of participation, ranging from *manipulation*, at the lower end, to *child-initiated, shared decisions with adults*, on the top rung.

> *when it comes time to hit the pen and paper stuff and put a program together.* (Email from Jo, Cycle 1, 8/5/97)

Jo was still perceiving me as an academic expert with a set task to complete while I saw myself mainly as a "process" consultant. It was apparent that I needed to be much more assertive about this.

However, my acceptance as a member of the school "team" was also becoming evident. During a meeting at which teachers and the storyteller were discussing arrangement for class participation, I sought permission to comment. I was gratified to hear the principal say, "You're one of the staff. Go ahead!" (Appendix J). Jo reiterated this sense of inclusion when she commented in an email "It was really great that you could make it to the school today … and I was really impressed that you spoke. Your comments and feedback are always welcome" (Reflective journal, Cycle 1, 18/4/97). Taken together, these incidents highlighted the continuing ambiguities in perceptions of my role.

There were also other changes in my role and relationships during this time. In particular, I sensed that I was becoming a confidante, especially for Jo, with email communication being instrumental in bringing about these changes. We found that the informality of email enabled an openness that would not have been possible in person. This was because email gave both of us a non-threatening way to raise issues and topics and to offer support that may not have been so easily said face-to-face. As an example, the following message was emailed:

> *Many thanks for the paper. It was magnificent. I particularly liked your finish where you articulate the key to the school's activities as lying in resourcefulness, skills and values of the school community members.* (Email to Jo, Cycle 1, 9/5/97)

Later, Jo commented on an earlier message of complaint and frustration:

> *Thanks for answering such a stupid email. I like to share my confusion and frustrations. It keeps my blood pressure down.* (Email from Jo, Cycle 1, 26/5/97)

In another exchange, the value of email for "offloading" concerns and frustrations was confirmed:

> *Yep!! I do like the old email… I get to mouth off…with nobody to interrupt me.* (Email from Jo, Cycle 1, 30/5/97)

Overall, this phase marked significant shifts in my role and relationships with the school. While I needed to keep working on dispelling the notion of expert, it was obvious that I was

also now accepted as a staff member, at least by key people such as Jo, Ann and the principal. With Jo, there was also a distinct deepening of our relationship that was being enhanced, by the informality and efficiency of email. I was becoming a facilitator rather than an observer.

The third theme that arose from data analysis and reflection during this phase concerned the emerging need for teacher professional development in environmental education. I had not anticipated the necessity for this because of the school's high levels of participation in environmental education activities and projects. However, it had becoming increasingly apparent that some form of professional development was necessary, especially if the commendable environmental education practices already implemented in some classrooms were to develop across the whole school, rather than in the current, ad hoc way. Some informal professional education, carried out through impromptu discussions and at the time of delivery of relevant literature, had already commenced with Ann and Jo, as is illustrated by the following journal excerpt:

> *Ann has a good grasp of environmental issues and implemented the "Five Star Garden". Jo has been "taking action" with her class for years through Project Club. Nevertheless, we also had a short but good discussion about the causes of environmental problems (in relation to Ian Lowe's article on ESD) and discussed issues of intergenerational equity, sustainability and growth economics. This openness to discuss, question and seek information /perspectives about environmental issues, even if only in snatched conversations, shows receptiveness to new ideas.* (Reflective journal, Cycle 1, 20/3/97)

However, my reflections on what I had learned from observing practice during this phase led me to realise that a more structured approach to environmental education was needed. I saw this as having two parts: a professional development component, and the development of an overall environmental education policy or framework for the school. For the first aspect, even though the school was well credentialed with its environmental awards and ongoing environmental activities, it was apparent that Ann, Jo, and Ian, the principal, were the mainstays of the school's environmental education. The engagement of all teachers in the school was desirable if environmental education, and learnscaping in particular, were to be successful and enduring. I also felt that the development of an overall environmental education framework should be a priority. I saw this as a way of bringing coherence to the large number of separate environmental activities that occurred throughout the school and, consequently, increasing the impact of the school's environmental education.

PHASE 6: REDEFINING THE PROJECT (TERMS 3 AND 4, 1997)

After the high energy inputs of Term 2, it became apparent that the teachers were "Earthwormed-out"[84] and that the teachers needed to "recharge their batteries" (Reflective journal, Cycle 1, 1997). Consequently, there was little interest in collaborating further on the learnscaping project at this stage. (While the school won the Queensland *Earthworm Award*, the failure to win the national award seemed to reduce enthusiasm for environmentally-oriented activities in the school; nevertheless, the school did run its annual *Koalathon*[85] in this period.) However, in the lead-up to the six-week summer vacation, preparations for the Christmas concert ensured that learnscaping was not a priority.

By default, this final phase of Cycle 1 became a period for intensive evaluation and reflection after the activity of the previous phase, providing an opportunity to further scrutinise the processes and outcomes of the *Earthworm Project*. I also continued to deepen my understandings of the school and its people through observation and interviews, and to further consolidate my role as researcher. My guiding questions for this phase illustrated this focus on learning from the *Earthworm Project* and applying these understandings to future planning. In phase 6, the following questions emerged:

- *How do we apply knowledge gained in previous phases to the goal of creating a learnscaping curriculum?*
- *How can the learnscaping project be reactivated and refocused?*

The first question was a trigger to ensure that I did not lose what had been learned through observation, analysis and reflection on the school's environmental education practices. With so many competing events impacting on the project I was concerned that I could be distracted from implementing the plan-act-reflect processes of action research. The second question focused specifically on the issue of the project's waning momentum and identified the need for special efforts to re-energise it. This question, in particular, reflected my growing sense of frustration as 1997 came to a close. At a time when I was able to invest considerable energy into advancing the project, the school participants were unavailable. It became obvious that the learnscaping project was not going to advance significantly in Term 4, and the six-week summer holiday was fast approaching. This meant that collaborative action in this action research project would have to be held over into 1998.

[84] Jo used this expression to explain why teachers were "taking a break" from the learnscaping project.
[85] This is an annual whole school and community fundraising walk for the Australian Koala Foundation.

Research Protocols and Processes

With little happening in terms of the collaborative aspects of the learnscaping project, I determined to use the time to broaden and deepen my understandings of the research situation. Hence, I conducted five interviews in Term 4 and transcribed and analysed these over the summer holiday period. The first of these interviews was with Ian, the principal, and was a face-to-face interview. The second was a focus group discussion with Ann and the early childhood teachers who had developed the integrated unit on "Birds". Jo also agreed to be interviewed in an individual face-to-face situation. I also conducted an interview with Linda, who represented the middle school teachers, while the last interview of the year was with Ann, the third of the three key participants to be interviewed.

The visits for interviews became opportunities to consolidate relationships and to explore the context further through observation and conversation. An excerpt from my journal, written after one such visit, illustrates this:

> *Had a chat to Jo and she revealed that all is not as harmonious between staff as it seems. There are a few teachers who are resistant to her personally, and to the whole Earthworm/ environmental focus of the school. She commented, though, that when the Earthworm submission was finally put together she was surprised that these teachers had produced work with the children that was significantly pro-environment. I want to explore this further and have arranged to interview Jo at length on 11 September. I also contacted Ian to see if I could talk to teachers from the middle part of the school. This is for two reasons. Firstly, I have not really had much contact with teachers from this part of the school and want to find out more about their ideas about learnscaping and, secondly, I think these are the "resistant" teachers that Jo was referring to!* (Reflective journal, Cycle 1, 28/8/97)

The five interviews had similar intentions. I was interested in finding out teachers' perceptions about the purpose of the learnscaping project, to discover what they had gained from the *Earthworm*/learnscaping activities to date, and to explore ideas for future developments in the project. Hence, interview schedules were drawn up with open-ended questions designed to elucidate thoughts and ideas about these three broad areas. All interviews were audiotaped, with interviewee permission, and were conducted in conversational style, rather than as a regimen of questions and answers. However, the wording of the questions, and the order in which they were presented, varied between interviews, depending on the flow of conversation and the time available. New topics were also investigated if considered appropriate, with new lines of questioning opening up in order to explore ideas further. This interactive, dialectical style helped elicit new information from interviewees, validated my interpretations of interviewees' comments as the five interviews proceeded, and also helped triangulate data between interviewees.

All interviews were arranged in advance of a visit, as I hoped to optimise interview conditions. However, practical difficulties arose with every session constrained by time. For example, after the interview with the principal, I wrote in my journal:

> *The handover ceremony for the care quilts to Ronald McDonald House went much longer that expected, 1 1/4 hours instead of 3/4 hour, so this interview was now in Ian's lunch hour, instead of in the quiet time we had scheduled. I got through most of what I wanted to ask, though it was rushed!* (Interview notes, Cycle 1, 18/6/97)

Interview conditions for the early childhood focus group were particularly difficult. One teacher, for example, was absent because of playground duty. The following journal entry illustrates the difficulties:

> *First, we changed rooms for a quieter spot but then there wasn't much time as it was morning tea. An earlier meeting for 8.15 was cancelled due to another staff meeting. The phone rang for one of the teachers, who was then absent from discussions for a period, and then we had to finish up shortly after she returned as classes were resuming. I did not get to ask all the questions but am happy with what was achieved under the circumstances. Boy, are these teachers busy!* (Interview notes, Cycle 1, 18/6/97)

Analyses and Reflections

This phase was illuminating but frustrating. The illumination came from learning about the people, the setting, and what teachers did, thought and hoped to achieve in environmental education. The interview with Ian, in particular, helped me to revise my understanding of my role in the project. This is illustrated by the following excerpt from this interview:

> *We'll get the committee to say where we are going with this plan, where we are going with the activities, and then we'll probably collect information from all over, from various people coming in and talking to us, like you, and then build up a plan through those processes. I don't see it as just taking plans from other places and imposing them onto our school. The process will be collecting information, collecting data about what are the best practices seen in schools and other institutions, also in environmental education centres and parks and places like that. Then we'll look at our clients in the school, who range from 5 year olds to 13 year olds, and look at what would best suit them to achieve our long term goals.* (Transcript, Cycle 1, 19/6/97)

I was relieved to hear these comments about the ways the project might develop as they confirmed I was seen as a consultant to the school, not the overall project manager. This verified what I had originally thought would be my role, but seemed contradicted by impressions that I was the "environmental education expert" with responsibility for preparing and writing the learnscaping curriculum. After this interview, I wrote in my journal:

> *I had been unsure as to whether I should take a more active role in the development of the learnscaping/EE strategy. However, after speaking to Ian, there is no doubt that he wants this process firmly in the hands of the school team. I am so relieved because this is as it*

> *should be. After all, the school has the biggest stake in the process and its outcomes. Ian stated that he would be seeking advice, inputs and expertise from a range of sources of which I am just one. It was obvious that he liked the way I worked, though, in not pushing a particular point of view or approach, and he welcomed my ideas and suggestions.*
>
> *This discussion has helped me to better understand my role. Rather than being the key facilitator (a role I didn't want for philosophical reasons and also because of time and energy commitments), I now see that I have more of a "guiding" brief. As an insider-outsider, I can see things broadly and perhaps differently, can make suggestions, find relevant and timely resources, make contacts, suggest strategies etc, but as just one of a number of people working to complete this project*. (Interview notes, Cycle 1, 18/6/97)

However, as Term 4 proceeded, I became frustrated with the lack of substantive progress in the project and the slow development of an overall environmental education framework for the school. Furthermore, mixed messages about my role re-emerged. For example, Jo wrote in an email:

> *Hope you are thinking hard about our environmental education policy… because Ian keeps hinting that I'm writing it… ho, ho, ho!!!* (Email from Jo, Cycle 1, 4/9/97)

By year's end, there was no doubt that inertia had set in, as end-of-year activities took time and energy away from our intended collaboration. The school's response to not winning the national *Earthworm Award* led Jo to comment on this lowering of morale and motivation:

> *At the moment we are all sulking around like very, very sore losers, as we found out that we didn't win the national Earthworm. Pouting adults are not a pretty sight!* (Email from Jo, Cycle 1, 17/10/ 97)

In the same email, Jo identified additional reasons for the inertia:

> *Have to admit I have started to wonder about the curriculum thingo, and quite frankly, I don't even know what goes into one. Do we have lots of fancy blurb, or just activities, or lots of specific activities, or general activities, or lots of everything, or what? Would really value your input as to where to start!* (Email from Jo, Cycle 1, 17/10/ 97)

Later in the same week, she reinforced this message of confusion about the project's purpose and design:

> *EE policy…shoot…definitely in the too hard basket at the moment!* (Email from Jo, Cycle 1, 23/10/ 97)

I responded to this plea by taking a collection of resources to the school on my next visit.[86] However, I also was developing my own doubts about the project's purposes, about my role, and whether I still had a viable doctoral research project. While Ian and I both believed that the school should have overall management of the project, these comments

[86] These included: Queensland Dept of Education (1993) *P-12 Environmental Education Curriculum Guide*; Gough (1992) *Blueprints for Greening Schools*; Smith and Coad (1996) *Ecoschool: An ESD Approach*.

from Jo, and my own observations, indicated that members of the school staff were not really able to take on this task. Their day-to-day teaching commitments, competing curriculum priorities, lack of time for planning, staff tensions, an "overdose" of environmental education projects, combined with limited knowledge of general environmental education practice were making the task extremely difficult. With holidays and the end-of-year Christmas concert drawing near, I resigned myself to the fact that the project had gone as far as it could for 1997. Indeed, it was possible that this hiatus foreshadowed the project's demise. I even anticipated that I might have to investigate a new setting in which to conduct my doctoral research.

Despite this anxiety, I was not ready to give up completely on the study. Instead, I used the cessation in this collaborative part of the project as an opportunity to focus on aspects of the study that I had been unable to explore in depth earlier. Consequently, I spent a considerable part of this period researching current literature on environmental education to help me better understand what was happening – and not happening – in the field.

LITERATURE REVIEW: ENVIRONMENTAL EDUCATION

As the collaborative "groundwork" of the learnscaping project wound down for the year, I shifted my attention to exploring the supporting literature. The primary area of literature review centred on school-based environmental education as I looked for explanations for issues and problems and ideas to advance the project. This review also provided ideas and resources for the later development of the literature review of my "critical concern" articulated in chapter 2. This section of review explores the nature and principles of environmental education, identifies key features of critical environmental education, examines whole school approaches to environmental education and discusses the relationship between environmental education and education for sustainability.

ENVIRONMENTAL EDUCATION: ITS NATURE AND PRINCIPLES

Environmental education is a still evolving field (Greenall, 1987; Hopkins, Damlamian, & Ospina, 1996) that grew from a diversity of educational areas that used the environment as a vehicle for teaching. Prior to the 1970s, environmental education was closely associated with environmental studies, outdoor education, nature studies, and environmental science, fields strongly embedded in the natural sciences, especially biology, ecology, physics and chemistry. Robottom and Hart (1992, p. 2) note that these fields lacked appreciation of "the essentially social and political character of environmental problems".

Field Code Changed

The first journal of environmental education was published in the United States in 1969. During the 1970s support grew for environmental education around the world with members of an IUCN workshop agreeing to an international definition of environmental education in 1970. In 1974, at a conference in Belgrade, the United Nations established a joint UNESCO-UNEP International Environmental Education Programme. At the Intergovernmental Conference on Environmental Education in Tbilisi in 1977, the "Tbilisi Declaration" set goals, objectives and guiding principles for environmental education. Both these conferences emphasised a view of environment that encompassed a broad spectrum of environmental, social, ethical, economic and cultural dimensions. Additionally, they advocated an interdisciplinary approach to addressing environmental, poverty, and equity concerns, with interest beyond local matters towards a global orientation. Such an expanded approach, however, has been difficult to implement in schools, bound as they are by single discipline studies, prescribed syllabuses, and teachers untrained in the pedagogical practices needed for such studies. The 1990s saw a renewed emphasis on these global goals and broad purposes through the recent concept of "education for sustainability"[87] (EFS) – a transdisciplinary approach to education with intergenerational concerns and a much wider appreciation of the varied contexts in which education occurs than was evident in earlier approaches. Not all environmental education practitioners have kept pace with these changes in orientation, however, with many persisting with approaches constituted in the 1960s and 1970s, and ignoring issues of sustainability. Robottom (1987a) suggests that continuing use of conservative approaches to environmental education depends less on how environmental educators conceive and practice environmental education, and much more on the ideological and theoretical orientations they hold about education generally.

Social theorists such as Habermas (1972) have written extensively about how ideology shapes a person's concepts, beliefs and values about his/herself and their place in the world. Educational theorists[88] have applied these ideas to education and theorised about the power of educators' underlying ideological beliefs in shaping their theoretical frameworks and pedagogical practices. While there have been several ways of categorising and re-categorising ideologies, they can generally be described as being conservative, liberal or critical/emancipatory[89] as Figure 4.3 shows.

[87] Education for sustainability is discussed in detail at the end of this section of literature review.
[88] These include Kemmis (2001), Lather (1991), Miller (1983), Skilbeck (1982), and Sterling (2001).
[89] For a detailed summary and analysis of how these differing ideological orientations apply to environmental education see Fein (1993) *Education for the environment: Critical curriculum theorising and environmental education.*

	CONSERVATIVE	LIBERAL	CRITICAL
Habermas (1972) (social theorist)	technical	practical	critical
Skilbeck (1982)	classical humanism	progressivism	reconstructionism
Miller (1983)	traditional	enquiry-decisionmaking	transformational
Kemmis, Cole & Suggett (1983)	vocational/ neo-classical	liberal/progressive	socially critical
Sterling (2001)[90]	scientific managerialism	progressive managerialism	ecological/ transformative

Figure 4.3. Categories of ideologies of education.

The significance of these categorisations lies not in their names, however, but in their implied meanings. The first category, for example, implies a technocratic approach to education typified by the idea of education being primarily about preparation for work within the existing economic system. Current managerialist approaches, where education mimics the business world (Sterling, 2001), typifies this conservative, technical approach where schools are viewed as instruments of the economy and society. In the liberal/ progressive category, education is seen broadly as preparation for life rather than work (Fien, 1993). This view acknowledges the place of education in social reform, but tends to support individual means to social change through education that encourages individuals to use their talents wisely and to take personal responsibility for civil reform. In the third category, a socially critical approach to education is proclaimed that sees a reciprocal relationship between school and society. In this view, schools, teachers and students are active members of society with capacities to confront, and change, unequal and exploitative structures; at the same time, it recognises that societal needs can help reshape schooling. Education in this approach has the potential to be transformative of society with a clear role in overcoming social inequalities and engaging students, and teachers, in social, political, economic and environmental activism. It is this latter orientation towards education that is seen to have the capacity to embrace sustainability as a core concept.

Education *in, about,* and *for* the Environment

These ideological frames have also been applied to environmental education with Fien (1993), Huckle (1983), Robottom (1987a), Stevenson (1987) and others proposing similar categories for the ideological orientations influencing environmental educators' beliefs and pedagogical practices. These have been reformulated into the three commonly accepted

[90] The labels used here are developed from my own interpretations of Sterling's work.

ways of understanding environmental education – education *in* the environment, education *about* the environment, and education *for* the environment (Fien & Greenall Gough, 1996; Huckle, 1983; Queensland Board of Teacher Registration, 1993; Queensland Department of Education, 1993; Robottom, 1987b).

Education *in* the Environment

Generally speaking, education *in* the environment uses the environment as a medium for education (Huckle, 1983). The environment becomes a resource supporting enquiry and the development of skills, and provides a setting for direct experiences (Chambers, 1995). It is a view of the environment that Huckle (1983) and Fien (1993) refer to as "Rousseauian", where environmental learning is a rationale for "pupil-centred, topic based learning which often reflects a rather naive respect for both children and nature" (Huckle, 1983, p.104). This form of environmental education is evidenced in many early childhood programs (Davis, 1998; Wilson, 1994) where it is explicitly intended to foster wonder, empathy, and love for the natural environment (Davis, 1998; Dighe, 1993). Many nature-based, interpretive environmental education programs also typify this naive respect for children and nature, exemplified by the comments of Murdoch (1993) that it is "through positive experiences in the environment, [that] children can be helped to overcome fears of the environment and to establish that important sense of "connectedness" with nature" (p. 4).

Education *in* the environment gives high priority to outdoor learning environments where the outdoors is both a setting and a resource for learning. Ryan and Ray (1991) comment that the basis of this kind of environmental education is that successful environmental education depends upon a relationship with the natural world. Environmental education in this orientation often gives emphasis to sensory activities and recognises the value of integrated approaches to environmental learning. Huckle (1986) asserts that this kind of environmental education also reflects "ideas of natural or ecological determinism that are at best romantic and at worst positively reactionary" (p. 13) because they fail to address the impacts of human-environment interactions as causal in environmental problems. Consequently, education *in* the environment tends to stress personal values, cooperation and new ethics, but makes little mention of politics, conflict and power.

Education *about* the Environment

Education *about* the environment emphasises facts, concepts and generalisations about environmental patterns, processes and problems (Fien, 1993). Features of education *about* the environment often include a focus on science learning – particularly studies of ecology

where activities are designed to help learners understand the complexity and functioning of natural systems. There are also opportunities to study environmental issues – such as ozone depletion, energy conservation or the social impacts of climate change – through exploring interactions between human systems and natural systems. This focus on science is seen as problematic, however, given that science is considered by many environmentalists as causal of environmental problems (Ashley, 2000). Nevertheless, such "environmental science" approaches are being reinterpreted within interdisciplinary frameworks, with contributions being evident from a broad range of sciences – including biological and physical sciences, health sciences, the social and political sciences, history, geography and economics. Furthermore, the role of media, the arts and new technologies are also acknowledged as vehicles for developing understandings *about* the environment (Ryan & Ray, 1991, p. 9). In Huckle's view, however, education *about* the environment is more a response to "the perceived needs of future technocrats and has little influence on the social system of the school" (p. 104), let alone the community or society at large and could equally be termed "education for environmental management and control" (Huckle, 1993, p. 61). This perspective is also supported by Robottom cited in Fein (1993) who argues that this form of environmental education promotes and legitimates a technocentric worldview. Such a view upholds the belief that environmental problems can be solved through technical and scientific means without consideration of the social context, the political aspects of decision-making or the vested interests that may exist in a controversial issue or problem.

Education *for* the Environment

Education *for* the environment, by contrast, adds the overtly political dimension that is missing from other forms of environmental education and is concerned with social action for change (Fien, 1993; Fien & Greenall Gough, 1996; Huckle, 1993; Queensland Board of Teacher Registration, 1993; Tilbury, 1995). It is this form of environmental education that Huckle (1993) claims most closely resembles education for sustainability. Fien (1993) describes education *for* the environment as representing an integration of a socially critical orientation in education with ecosocialist environmental ideology (p.43). Particular to education *for* the environment is an explicit action component, seen as having the greatest potential for developing attitudes, values and behaviours that promote healthy, just and sustainable lifestyle choices. Through education *for* the environment, learners develop a sense of responsibility and active participation in the resolution of environmental problems (Tilbury, 1995).

Education *for* the environment is also built on the belief that social critique, the ability to problematise existing social practices, ideas, values and institutions, and inclusive democratic social practices are essential for working together for sustainability. There is a commitment to "making a difference" through democratic decision-making based on local issues and concerns, but reflecting the global nature and interconnections of environmental issues. Central to education *for* the environment are critical pedagogical values, principles and practices, which Stevenson (1987, p. 75) discusses represent "an extensive list of curriculum and pedagogical contradictions" between critical education *for* the environment and dominant approaches to teaching and learning. Introducing environmental education into the curriculum implies broad and often contradictory parameters of scientific knowledge, concern with controversial attitudes, values and belief systems and implies both local interest and global perspectives. The complex, interdisciplinary and activist nature of environmental education poses a real challenge to educators because its critical orientation challenges the status quo in schools, seeking to change their organisational and social structures as well as their ways of teaching and learning (Huckle, 1993; Sterling, 1993; Stevenson, 1987; Tilbury, 1995). Existing structures and practices act to resist the counter-hegemonic processes that education *for* the environment seeks to introduce, thus making it difficult for environmental education to have an impact. As Fien (1993, p. 43) states "this is the dilemma of the social reproduction versus social transformation potential of education".

Integrating Education *in, about* and *for* the Environment

In effect, education *for* the environment is a multilayered set of approaches where the values, skills and knowledges of education *in* and *about* the environment provide foundations and reinforcement for education *for* the environment. As stated by the Queensland Board of Teacher Registration (1993):

> The integration of these three approaches to environmental education means that it is aimed at educating citizens who are knowledgeable about the natural environment and social environment, skilled in researching environmental issues, aware of how to help resolve these issues and motivated to work towards a better environment for all. (p. 24)

Fien and Greenall Gough (1996), Huckle (1993), the Queensland Board of Teacher Registration (1993) and Tilbury (1995) argue that education *for* the environment is the only really effective form of environmental education because it actively seeks to create conditions for a transition to sustainability. However, the appropriateness of such a view is not uncontested, with theorists and practitioners alike "engaging the debate"[91, 92] about such

[91] See Robottom & Hart (1993).

a role for environmental education. Nevertheless, this socially critical version, which integrates all the forms of environmental education, is the version that many believe is evolving into the more challenging notion of education for sustainability. As a consequence, states Fien (2001a) "Lessons learned from environmental education provide valuable insight for developing the broader notion of education for sustainable development" (p. 28). As it is this critical form of environmental education which underpins this work, use of the term "environmental education" will imply a socially critical orientation from this point forward.

KEY PRINCIPLES AND FEATURES OF CRITICAL ENVIRONMENTAL EDUCATION

This next section articulates the key principles and features of critical environmental education. These have been drawn from a range of sources across the 30-year history of environmental education.[93]

Holistic Education

A principle viewed by many as overarching all other principles is that environmental education should be an holistic form of education – where holisms apply in the beliefs, ideas and practices of both the environment and education. This principle recognises that we live in a world built on relationships, connections and interdependent linkages rather than disassociations and separateness (Robinson & Shallcross, 1998; Sterling, 2001). The Commonwealth Department of Environment and Heritage (2000) also emphasises the holistic nature of environmental education, stating that:

> To address environmental challenges, people need to think broadly and understand systems, connections, patterns and causes. The challenges themselves frequently have social, scientific, cultural, economic and ethical aspects, all of which must be considered for their effective management. Specialist discipline-based knowledge, while contributing critically, is no longer adequate by itself – an holistic appreciation of the context of environmental problems is essential. (p. 4)

Tilbury (1995) also stresses the importance of an holistic approach for environmental education. She comments that its holistic nature is characterised by the use of "synthesis" in the study of environment and development problems; of "macroscopic" analysis of issues; and the desire to use curriculum approaches that combine and develop "scientific enquiry, social science thinking and practical skills together with the creative and aesthetic sensibilities of the languages and arts" (p. 200).

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[92] Recent critique by Jickling & Spork (1998), counter-critiqued by Fien (2000), could be interpreted as a liberal "backlash" to socially critical conceptions of environmental education.

[93] These range from the 1976 Belgrade Charter, one of the original policy documents outlining environmental education, and also include Fien (1993); Qld BTR (1993), Sterling (1993), and Tilbury (1995).

However, Sterling (1993) argues that while holism is implicit in environmental education it is insufficiently articulated and enacted. Robinson and Shallcross (1998) support this view, maintaining that the worsening environmental crises actually signal the failure of environmental education to develop an holistic education, and to have this impact upon the schooling sector. However, they also acknowledge the difficulties associated with enacting holistic education approaches into most schools, especially as subject-specific structures and hierarchies prevail. As a remedy, these authors urge more investments into community-based and lifelong education and training provision to broaden the impact of environmental education, and greater integration of neglected emotional domains into environmental educational practice. In particular, they cite Goleman (1995) who asserts that "emotional intelligence" is essential for effective decision-making. With such expansions, comment Robinson and Shallcross (1998), environmental education has the potential to become an holistic education that is "thematic, transdisciplinary or interdisciplinary with a coherent cognitive focus supported by strategies to develop emotional intelligence which will lead to sustainable action at individual, institutional and community levels" (p. 72).

Ecological Worldview

A characteristic element of holism in environmental education concerns human-environment integration in a broad ecocentric approach. According to Eckersley (1992) this is where:

> The world [is seen as] an intrinsically dynamic, interconnected web of relations in which there are no absolutely discrete entities and no absolute dividing lines between the living and the nonliving, the animate and the inanimate, or the human and the nonhuman. (p. 49)

Another way to represent an ecocentric approach is to consider "environment" as comprising a number of interrelated systems. These might be seen as biophysical, social, economic and political systems (Fien & Greenall Gough, 1996), or as having aesthetic, social, economic, political, historical and cultural dimensions (UNESCO-UNEP, 1978). Alternatively, the Queensland Department of Education (1993) identifies the environment as having personal, social and natural components. These differences, however, are simply matters of classification and semantics. What is more important is the recognition of the holism of environment, where this is much more than nature and includes knowledge and appreciation of human-environment interactions built upon the complexities, intersections and interactions of many factors – biological, geographical, social, political, historical, aesthetic, spiritual, economic, historical, cultural and political. As Greig, Pike and Selby (1989) posit, holistic environmental thinking involves a shift from an "anthropocentric (person-centred) philosophy with its built-in "biospheric inegalitarianism" to a biocentric

(life-centred) philosophy which humbly recognises that we are within the environment; that reverence rather than ruthlessness is due to the natural world" (p. 9).

Relevant, Student-Centred Learning

Another significant element of holistic, critical environmental education is that learning should be relevant to students' interests and concerns (Stapp & Cox, 1981; Tilbury, 1995). Relevance in environmental education comes predominantly from approaches that are student-centred and activity-based, rather than teacher-directed and content-focused. Gough (1992) characterises student-centredness as "building on the experiences, perceptions, feelings and existing knowledge of young people and helping them to explore questions, issues and problems which arise from their own understandings of their environmental rights and responsibilities" (p. 26). Marsh (2001) expands on this by illustrating a diversity of teaching techniques including inquiry, cooperative learning, independent studies and computer-based approaches that exemplify student-centred teaching and learning.

Hart (1997), Lucas (1997) and Wilson (1994) also support the idea of relevance in learning with "relevance" seen in terms of students and their connections with nature. Positive student-nature relationships are seen as fundamentally important for the development of an ecocentric stance that engenders understanding, respect and reverence for the natural environment, while also developing concern for improving and enhancing environmental quality and emphasising environmental action. Lucas (1997), in particular, promotes the schoolground as one of the most potentially relevant places for environmental education. This is so, he asserts, because schoolgrounds offer substantial "natural" environmental experiences for many students, especially those living in cities, and because of the continuity of schoolgrounds throughout students' lives.

Relevant environmental learning experiences at school may also be seen as springboards to environmental actions at home and in the community, as students act as ambassadors for environmentally responsible behaviours and reinforce the relevance of human-environment connections (Ballantyne, Fien, & Packer, 2001; Hart, 1997). Thus, student-centred learning also has the potential to reach beyond those most directly involved in the learning, and to impact on the knowledge, skills and actions of a much wider audience.

Values, Issues and Inquiry-Based Learning

Another important characteristic of critical environmental education is its utilisation of pedagogical approaches that engage and empower learners. This is despite the fact that environmental issues and problems often appear too remote or overwhelming for many

individuals or communities to feel they can "make a difference". Fien (1993) writes that "critical environmental education emphasises critical thinking and problem solving skills through a variety of practical and interdisciplinary learning experiences which focus on real-world problems and involve the study of a wide range of sources and types of information" (p. 55). These critical strategies involve problem-based and inquiry approaches to the analysis of issues derived from actual environmental and social concerns, and also emphasise learning about, and acting upon, these issues at the local level. Students can also develop investigative and thinking skills through issues and inquiry learning, thus contributing to their ability to participate effectively in society (Chambers, 1995; Gordon, 1999; Marsh, 2001). These approaches can encourage students to take responsibility for their learning, help develop cooperative learning, and encourage communication of ideas within and between groups of students (Hamston & Murdoch, 1996).

The exploration, clarification and development of values within the context of issues investigations and problem solving are also recognised as fundamental to critical environmental education. Tilbury (1995) comments that education *for* the environment uses such issues and problems as a context, not only for understanding the issues and problems, but also for the exploration of moral, social and political values required for the development of an environmental ethic. An ultimate goal of such explorations into issues and problems is the development of an environmental ethic that jointly examines human responsibilities to nature as well as human responsibilities to each other (Fien, 1993). Meadows (1990) reinforces this ethical dimension, declaring that environmental education "is fundamentally education in problem solving – but problem-solving from a philosophical basis of holism.…The goal is not just to solve a problem with a narrow focus that makes another problem worse…not just to make a correction and restore the status quo, but to make things better" (p. 5).

However, Wink (1997) criticises the use of the term "problem solving", so widely used by environmental educators. She draws on the ideas of Freire to suggest that "problem-posing" is a better concept. Problem posing is a non-linear process that begins with the intellectual rigour of naming a problem or situation from a student's perspective, and only then is it followed by problem solving and actions to overcome the problem. She contends that problem posing is a more problematical approach for dealing with complex issues and is more likely to engage learners with a spirit of inquiry and questioning of situations that directly affect them. As a consequence, such attributes are more likely to lead to actions and transformation than the simplistic linearity of many problem solving approaches (Wink,

1997). As many educators with a critical orientation subscribe to the use of such non-linear approaches for issues investigation[94] perhaps problem posing is a preferable term for describing ways of investigating environmental and social issues.[95] Nonetheless, the matter of most significance is that opportunities are provided for students to investigate real, relevant issues and dilemmas and to have them think about their attitudes and values in relation to these. This is the real distinction between critical environmental pedagogical approaches and more traditional teaching and learning options.

Action-Based Learning

Critical environmental education also emphasises the fundamental pedagogical goal of learners learning to take "socially important action" (Posch, 1997, p. 4). This principle exemplifies a holism because inquiry and action are seen as two parts of a single process. Inquiry, on its own, is not a sufficient outcome. As Fien (1993), Huckle (1997), Posch (1997) and Tilbury (1995) state, an action-based inquiry approach to education is needed to prepare learners, not only to understand environmental issues, but also to help them become active citizens with the capacities and skills for creating social and environmental change.

This notion of integrating action with inquiry underpins the concept of "action competence" (Jensen & Schnack, 1994; Schnack, 2000) developed from democratic approaches to health education,[96] and recently applied to environmental education. According to Colquhoun (2000), action competence attempts to "break free from the moralising behaviour modification" (p. 94) that is characteristic of non-critical approaches to health and environmental education. Instead, it involves the development, at both the personal and the societal level, of students' abilities to take action targeted towards solutions to the real problems of students' daily lives. As such, action competence encompasses a collective of ideas about taking action. These include: democratic ideals and processes; voluntary participation; notions of the common good and collective action to achieve this; "prerequisite" skills and knowledge and the potential to use these within schools as organisations; realistic understandings of social processes and contexts; raised ecological awareness; the making and remaking of community; community involvement in decision-making; and a shared social research agenda than extends beyond socio-psychological

[94] These include: *Action Research*, used by environmental educators; *Democratic Health Model (IVAC)*, developed in Denmark for exploring health and environmental issues; *Social Investigation Strategy* (SIS), used for investigating social issues; and *TELSTAR*, a simplified version of SIS, popular in primary schools.
[95] For more on problem posing and how Wink applies this process to teaching children in primary school, more details are found in her excellent book on critical pedagogy.
[96] "Action competence", as an empowering concept, has strong acceptance in Denmark.

behavioural change models (Colquhoun, 2000, p. 101). Inquiry without critical action is seen as a very limited form of inquiry, not compatible with critical approaches to education.

Taken collectively, action-oriented approaches within a critical paradigm are change processes aimed at challenging the status quo. They encourage students to:

- identify an issue or problem;
- recognise complexity and the interdisciplinary nature of many problems;
- challenge their own and others' values;
- research and investigate the issue;
- propose solutions;
- make changes;
- reflect on the changes and the processes of change.
  (Chambers, 1995; Gordon, 1999; Hamston & Murdoch, 1996; Hart, 1997)

To summarise, action-based inquiry gives students regular involvement in learning how to resolve problems, develop and evaluate visions of alternative futures, and work actively in and with the community on problems that are of significance to them (Fien, 1999). Hart (1997) also supports this view, commenting that "the ability to evaluate environmental issues critically as a guide to action is basic to the development of competent, responsible environmental behaviour" (p. 91). Consequently, he says, a strong case is made for the utilisation of action research as an appropriate way of bringing inquiry and action together. He also asserts that action research is relevant to all age groups, with only the degree of sophistication varying. Hence, even the very young can be actively engaged in developing the capacity to participate in environmental research, planning and actions.

Allied with action-based learning in critical environmental education is another essential feature – the development of political literacy. According to Crick and Porter, cited in Fien (1993) and Huckle (1985), political literacy provides students with the understandings, strategies and commitment to participate in critically informed and active ways to resolve issues and problems. As Fien contends, political literacy provides students "with the knowledge, skills and commitment they require in order to play an informed and active role in the political systems of power and decision-making in which they live" (1993, p. 69). In short, it requires students to have a broad, reflective knowledge about the environment; critical thinking skills that help them understand and critique issues of power, resistance and marginalisation; to be committed to inclusive decision-making processes; and to have experience in resolving and negotiating around environmental issues (Tilbury, 1995).

Political literacy should not only confront students with issues and controversies, say Land and Gilbert (1994) but their schools "should mirror a democratic formal curriculum by offering a good example of respect for democracy, both in its governance through the involvement of students and in reasoned, intellectual honesty as integral to scholarship and teacher-student relationships" (p. 1981).

One way of helping learners develop political literacy is through participation in action research, already identified as providing opportunities for students to work with the "Realpolitik" of their classroom, school or immediate community. Through action research, students learn the skills of negotiation, argumentation, discussion and collaboration; they learn to confront marginalisation; they develop public awareness campaigns; and learn to advocate on behalf of the environment (Hart, 1997). It is also useful because of the synergies created between inquiry, action, politics and democratic participation.

Hart states that action research "supports the participation of children in investigating and acting on environmental issues that are important in their own lives and the lives of their communities" (p. 92). As Breiting and Banniche (1995) comment, "democracy is not something [children] should hear about in class, but something they should learn to take an active part in" (p. 20). Hart insists that even young children have the capacity for active participation in decisions and actions about their schooling which helps builds their political literacy from a very early age. He proposes a "ladder of children's participation"[97] (Figure 4.4) which indicates varying levels of participation. The lowest rungs signify non-participation while the top rung identifies the highest levels of political literacy and participation. At this top level, children are highly active politically, both as curriculum decision-makers and environmental activists.

Integrated Curriculum Approaches

Critical environmental education also has a history of support for holistic, integrated approaches to curriculum.[98] As Hamston and Murdoch (1996) comment:

> The real world is not fragmented or boxed into separate compartments. Life is a complex mix of interrelated experiences – each action affects another – and people depend on each other and on the planet for their very survival. Our curriculum should acknowledge and reflect the nature of this connectedness. (p. 5)

[97] From *Children's participation: The theory and practice of involving young citizens in community development and environmental care* (p. 43), by R. Hart, 1997, New York, UNICEF. Copyright 1997 by UNICEF.

[98] A counter argument is provided in a recent article by Scott (2002) who argues that an holistic worldview can be construed as assuming stability and control. In a postmodern world, he suggests, such a stance is open to challenge and represents but one possible way of understanding environment, education and other cultural and human relationships.

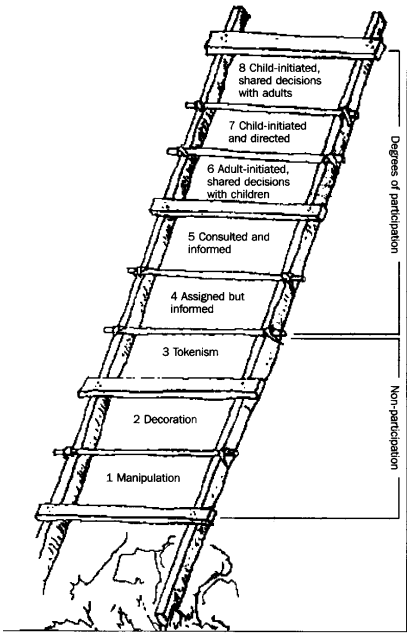

Figure 4.4. Hart's ladder of children's participation.

Thus, by providing opportunities and principles to deepen learning through overcoming the boundaries of separate subject specialisations, integrated approaches are believed to better replicate the "real" world outlined above. There is also some evidence that learning outcomes are enhanced when integrated approaches are used as the basis for designing curriculum.[99]

Integrated curriculum can take many forms. Drake (1993) and Warhurst (1994) comment that there are a number of ways to enact integrated curriculum, some more effective than others. However, it is essential that environmental education does not become an "add-on" to school curricula already considered to be "overloaded" by many teachers, nor is it desirable for it to be confined to just one part of the curriculum (Fien, 2001a; Griffith University, 2002; Tilbury, 1995), such as science or social education (Oulton & Scott, 1994; Walker, 1995). Overall, integrated curriculum is a philosophical, pedagogical and practical way of ensuring that the total curriculum is relevant and meaningful for the challenges of guiding students towards sustainable ways of living (Galang, 1997).

[99] These findings are in a report by Lieberman and Hoody (1998) based on a 14-school study comparing the achievement data of students whose learning was developed through integration with those taught traditionally.

In reality, however, environmental education is usually practised as an add-on in most schools, even though "the environment", as a complete educational philosophy that infiltrates all aspects of a school's operations and pedagogical practices, has been promulgated since the 1960s (Ahier, 1995).[100] Nevertheless, by providing some change-focused opportunities and by building capacity for deeper and more meaningful change in the future, an add-on approach still has value. The next section outlines some of the ways that environmental education is typically incorporated into school curricula. It is to be noted, however, that these strategies are not mutually exclusive. In practice, one approach is usually in combination with elements of another.

Integration around Content Themes or Topics

This is one of the most common ways that teachers implement environmental education and combines the knowledge, skills, and conceptual understandings of more than one subject area in some integrated way (Warhurst, 1994). This kind of curriculum integration is sometimes referred to as the "multidisciplinary thematic approach" (Marsh, 2001) where a central theme is identified and each subject area contributes separately to the theme from the perspective of that particular subject. Themes help to make the curriculum more cohesive, and assist teachers and learners to make some connections between subject areas. However, learning is often shallow with connections between curriculum areas sometimes forced or artificial. Another criticism is that students may still have difficulty transferring processes from one subject area to another because of the boundaries that exist around subject areas. Another drawback of themed content approaches is that it is often limited to single classrooms, thus isolating the results of the studies to small numbers of learners. Moreover, the use of themes for environmental education does not guarantee that learning will lead to actions, because the focus of learning may remain on content rather than on issues. This view is supported by Gordon (1999) and Hamston and Murdoch (1996) who also comment that thematic approaches are generally inadequate for building understandings and actions for dealing effectively with significant social and environmental issues and problems.

Integration around Competencies and Skills

This kind of curriculum integration does not recognise the sovereignty of traditional subject areas. Instead it brings together activities and experiences that assist students to develop specific skills and competencies across disciplines. It is a process well known in early

[100] The concept of *Sustainable Schools*, an holistic approach to education for sustainability, is just beginning to engender broad interest in Australia at the time of writing (early 2003).

childhood education, where play is recognised as an integrating activity that supports children's emergent understandings and growing competencies across all areas of development – such as language, cognition, and physical, social and emotional development (Perry & Irwin, 2000). It is also quite common in the middle primary school years, states Grundy (1994), where skills and processes viewed as essential elements of the curriculum become the focus. Metacognition is often emphasised in this approach, with critical thinking skills becoming the organising principle for ordering and structuring the curriculum (Drake, 1993). Students' capacities for collecting, analysing and organising information, problem solving, using technology or cultural/ environmental understanding are highlighted, for example. Another example of the use of this kind of approach is where a teacher frames teaching and learning around "multiple intelligences" (Warhurst, 1994).

Integration around Problems and Issues

Another common approach to curriculum integration in critical environmental education involves learning based on issues of substance and significance, especially those that are important to students. As has already been discussed, issues-based approaches are strongly supported because of their capacity to problematise local problems and issues and their relevance to learners. Through the exploration of real and relevant environmental issues, issues investigation becomes "a context for the exploration of moral, social and political values required for the development of an environmental ethic" (Tilbury, 1995 , p. 202).

The recognition that issues cannot be dealt with purely at the subject level underpins the use of integration around issues. Social justice issues such as racism, for example, need to be tackled at the whole school level in order to be inclusive of all groups of students – although there may be special implications in some subject areas, such as girls and Mathematics, or boys and English. Such issues, like many environmental issues, are cross-curricular in that they permeate all aspects of school life – the playground, the staffroom, the classroom learning environment, the administrative and organisational structures and the relationships between students and between staff, students and the community (Warhurst, 1994). The value of this approach for environmental education, emphasises Moroni (1978), is that "interdisciplinarity reveals the unity and variety of phenomena so that the best ways of tackling environmental questions, which are often complex and problematical, can be worked out" (p. 483). As a result, learners are more likely to come to understand "the big picture" rather than isolated, unconnected facts and to take action to improve their local social and environmental conditions.

Integration around Projects, Clubs, Competitions and Awards

The "environmental project" is another popular way for schools to integrate environmental education into their curriculum. Projects provide opportunities for extended engagement with a topic or issue, which also enhances the possibilities for taking action. A real benefit, comments Taylor (1996), is that environmental education projects have the ability to meet the immediate needs of an identified group and can be used as a problem solving tool in a specific area. Projects also have the benefit of being able to engage students socially with each other, their teachers and the wider community. Hence, they are useful ways of building social connectedness, and maintaining and extending participation in meaningful learning. A criticism of the project approach, however, is that the scope of the initiative is often limited in terms of objectives and duration. Breiting and Banniche (1995) support these criticisms, commenting that whatever students learn in a given context tends to remain connected to that context and that "considerable effort must therefore be made to ensure that [students] are able to make generalisations from what they have learned in working with a given concrete problem" (p. 35).

This same criticism implying narrowness can also be applied to the "club" approach to environmental education. While participants are often highly motivated, they are usually small in number. This limits both the scope of the environmental activity and the capacity for issues-based learning to fully impact on members inside the club, as well as outside. However, where projects and clubs are incorporated as initiatives within a broader environmental education framework, this criticism may be less applicable. Breiting and Banniche (1995) stress the value of a deeper and broader approach to clubs and projects than is typically seen in schools. They comment that their experiences in schools in Denmark reveal the importance of students working on more than one environmental project throughout the year. They note that "by working on at least two projects, placed well apart in the year, there is an opportunity to concentrate especially on further developing in the second project the insight gained from the first" (p. 35).

These comments also emphasise the importance of project monitoring and evaluation. Regardless of whether or not formal monitoring of a project is required, monitoring provides a way of deepening the learning stemming from the project (Hart, 1997). Hart also emphasises that monitoring should be ongoing, rather than evaluation that compares "before" and "after" snapshots. Projects conceived as action research, claims Hart, have the advantage in that monitoring and evaluation are already integral. A focus on monitoring and evaluation also means that learning developed in one project becomes available as a

foundation for learning in new projects. This aids in the development of children's "conscientization" about their participation in projects, states Hart, a process he considers the "main goal of children's participation projects" (1997, p. 26).

Environmental award schemes and competitions offer another way of encouraging environmental education in schools, being useful for creating and maintaining motivation. They can also provide quick and easy ways to get children's inputs and perspectives. Hart, however, cautions against the use of competitions where individual student "winners" are identified and where adult control is not relinquished. Despite this concern, he emphasises that where students work in groups to prepare proposals, or work on tasks, and/or share results, awards and competitions can be very successful. Chambers (1995) also critiques use of awards and competitions, cautioning that while award schemes and competitions might offer opportunities to engage in projects which have an action-focus, such as recycling aluminium cans, they need to be used primarily to increase environmental understanding, and "not undertaken as superficial environmental action or seen primarily as a fund-raiser" (p. 22). He states that those schemes undertaken in partnership with conservation groups or local authorities with perhaps a broad social and environmental agenda, may offer outcomes that are more educationally and environmentally rewarding, than those sponsored by commercial entities which may have limited benefit.

Summary Comment about Integration: Whole School[101]

The essence of holistic education is connectedness (Greig et al., 1989). It is therefore desirable that environmental education is implemented in integrated ways because these help to reinforce connections and relationships. In the previous section I discussed some of the common and often successful ways that teachers facilitate school-based environmental education and implement curriculum integration. A more powerful holism, however, is the implementation of environmental education as a "whole of school" approach (Gough, 1992; Murdoch, 1993; Palmer & Neal, 1994; Randle, 1991). The value of this holism is that it helps overcome the fragmentation and dissipation of environmental education efforts when only a part of a school system, and only a few teachers and students, have a commitment to issues of environment and sustainability. Whole of school approaches help facilitate alignment between a school's environmental goals, its explicit curriculum, its organisational and decision-making practices, and its day to day operational practices (such as heating and cooling, waste management and chemical use). Furthermore, whole school

[101] This topic is introduced here because it forms part of this initial review of literature about environmental education. However, as a significant issue for the whole of this study, a more extensive discussion appears in chapter 5, in the literature review associated with Cycle 2.

approaches also become more effective at raising awareness of issues, at creating stronger school-community partnerships to support activities and actions, and at maximising resources (Collings, 1996). Consequently, they make for a stronger and more resilient approach to environmental education because the school "practices what it teaches".[102]

EDUCATION FOR SUSTAINABILITY

In chapter 2, I discussed how "sustainability", "sustainable development" and "ecologically sustainable development" (ESD), are contentious, ill-defined, and still developing concepts. Consequently, education related to understanding and addressing sustainability issues is also lacking in clarity. An illustration of this can be found in the wide range of terms use to refer to such an education. Clarification is needed at both national and international levels, state Hopkins, Damlamian and Ospina (1996), and concede that, because this must involve all stakeholders, agreement about "education for sustainable development"[103] will be lengthy process. At the broadest level, however, these authors contend that the concepts of human development, social development and economic development need to be integrated with environmental concerns in an holistic (educational) framework.[104]

Robinson and Shalcross (1998) prefer the expression "education for sustainable living" and share the view of Hopkins et al. (1996), that this is a meta-concept. They contend that reference to "sustainable lifestyles", rather than sustainable development implies attention to personal actions and responsibilities as well as understandings of the structural and ideological forces that circumscribe people's current choices and actions. From their viewpoint, education for sustainable living involves the integration of environmental education and development education, with opportunities for cross-curricular investigations around issues in health education, personal and social education, economic and industrial understanding and environmental concerns.

Nixon, Sankey, Furey, and Simmons (1999) choose the term "education for sustainability" (EFS) to denote education around issues of sustainability. They comment that it is "by definition a complex and vulnerable formation, often polarised in terms of ecological sustainability issues, on the one hand, and social justice issues on the other" (p. 307). Thus, in trying to bring together different curriculum, pedagogical and political interest groups, its

[102] This saying comes from the Ashgrove Healthy School brochure (1994).

[103] This is the terminology that these authors use.

[104] Recent reports from the World Summit on Sustainable Development in Johannesburg 2002 - *Sustain[ed*): Issue 4 - indicate that definitional debates about SD, and consequently EFS, are over. They state that the focus must now shift from "what" to "how" sustainability can be achieved.

contested and controversial nature becomes manifest. These same coalitions also push forward the boundaries of the curriculum and offer alternatives to current practices.

While there has not been agreement on terminology and on all aspects of what constitutes education concerned with issues of sustainability, nevertheless, there does appear to be some consensus forming around use of "education for sustainability" as employed by Nixon, Sankey, Furey, & Simmons (1999). Of greater important than terminology, however, is growing acknowledgement that EFS must be characterised by the integration of socio-ecological approaches, rather than polarisation around either ecological or social justice issues. The latter, state Nixon et al. is the cause for much of the contestation and ambiguity surrounding terminology.

This view is reinforced in a number of recent UN publications. One is the UNESCO report (1997) which claims that "citizenship" should be amongst the primary objectives of education for sustainability. The report continues:

> It would [also] require increased attention to the humanities and social sciences in the curriculum. It requires students to learn to identify elements of unsustainable development and to address these, to envision different ways of living and to participate in community life to bring these visions into effect. These skills and abilities underlie good citizenship, and help to build an informed, concerned and active populace. In this way education for sustainability contributes to education for democracy and peace. (p. 24)

More recently, the report released in conjunction with the World Summit on Sustainability also emphasises this socio-ecological view of education for sustainability (UNED-UK Education Task Group, 2002). It states that education for sustainable development represents a "new vision of education that seeks to empower people of all ages to assume responsibility for creating a sustainable future" (p. 7). This vision emphasises a holistic, interdisciplinary approach to education to help learners make decisions that consider the long-term future of the economy, ecology and social wellbeing of communities. It also highlights the key role that educators play as agents of change.

Irrespective of how one names or describes education concerned with issues of sustainability, what is obvious is that current educational practices need enormous change, precisely because they do not take an holistic, integrated, empowering approach to education. Old educational forms, theories and practices are no longer adequate, if indeed they ever were, in light of the challenges now facing humanity. Nevertheless, "education for sustainable development is simply good education" as is pointed out by the UNESCO report (1997, p. 47), and good education should make students aware of the interdependence of life on earth in order to prepare them for the future.

Relating Environmental Education and Education for Sustainability

Education for sustainability has not emerged in a vacuum. While arguably not the same as environmental education, these two forms of education, both concerned with ecological issues, are closely linked. As I commented at the beginning of this literature review, education for sustainability and the critical form of environmental education appear to be converging into a single form. This review finishes with an examination of environmental education and its relationship with education for sustainability.

While education for sustainability is recent in origin, and is still in its early days of being discussed, debated and theorised, environmental education has a longer history. It emerged after the United Nations Conference on the Human Environment in Stockholm in June 1972, which recommended that environmental education be recognised and promoted in all countries (UNESCO, 1997). Initially, at least, environmental education focused primarily on the natural environment and its protection and hence has been "seen as an important part of education for sustainable development but not its equivalent" (Hopkins et al., 1996, p. 5). As environmental education has evolved into a broader, more political and interdisciplinary form of education concerned with environmental issues, the distinctions between environmental education and education for sustainability have become blurred. Indeed, the UNESCO report (1997) acknowledges that "It is clear that the roots of education for sustainable development are firmly planted in environmental education" (p. 27). Further, this report states that "lessons learned from environmental education provide valuable insight for developing the broader notion of education for sustainable development" (p. 28).

Environmental education has provided a solid foundation and a sound investment with respect to overcoming the environmental and social challenges that must be met. As Hopkins et al. (1996) indicate:

> Thousand of workshops and training programmes have been held in the past twenty years, covering most of the countries of the world. Print and audiovisual materials in a host of languages have been disseminated; organisations have been established in the majority of nations and a great deal has been accomplished regarding institutional capacity-building. Networks amongst specialists, institutions, non-governmental organisations and national governments have been developed. (p. 8-9)

Thus, these authors continue, there has been much to build upon and much to be learnt from these critical years of mobilisation. Furthermore, environmental education will continue to play a leading role in developing ideas and practices around issues of education, environment and sustainability because it already engages so many people around the world through practice, discussion and debate. In addition to similar and complementary

educational fields – including global education, development education, multicultural education, conservation education, outdoor education, futures education, peace education, civil rights education and others – environmental education's catalytic role in promoting social, environmental and educational change offers clear directions and pathways for developments in education for sustainability.

CONCLUDING COMMENTS ABOUT ENVIRONMENTAL EDUCATION

This review of literature provides an overview of environmental education, has explored its short history and examines its links to the emerging field of education for sustainability. In this overview, key principles and features of critical environmental education that reveal the innovative and transformative nature of its educational practices have been identified. These characteristics – holistic, student-centred education, issues-based and action approaches to learning, an emphasis on political literacy, and the development of integrated curriculum and whole school approaches – are by no means exhaustive or prescriptive. Rather, they are indicative of the qualities that collectively distinguish environmental education from mainstream curriculum and pedagogical underpinnings and practices.

It is now recognised that a reorientation of education – indeed a "new vision" – is needed to help address the global challenges of unsustainable development. Environmental education has already made a significant contribution towards this reorientation and, as it continues to evolve, new possibilities are emerging. Within schooling, it represents a "new generation" (Fien, 2001b, p. 30) of educational thinking and practice that challenges and aims to reshape how people and environments interact. However, it has also demonstrated its capacity to transcend the rather narrow educational domain of schooling and to contribute, more fully than at present, to addressing the global educational, ecological, and social challenges of the times. As a consequence, environmental eduction has been, and continues to be, a critically important field for social transformation.

OVERVIEW OF FIRST CYCLE

The first section of this chapter detailed the six phases in Cycle 1 of this action research. This included a narrative account, a summary of strategies and protocols in data collection and analysis, and the identification of emergent issues for each phase. The second section was a review of literature related to critical environmental education. This was the area of literature that most influenced my understandings and actions in the learnscaping project during this cycle, as well as shaping my judgements about its curriculum outcomes.

This third section turns to a discussion and analysis of the first cycle in the light of this literature review. It is organised into four sub-sections: a description and critique of the curriculum outcomes generated in this cycle, an identification and discussion of problematic features in the project, a discussion of emergent themes that helped create my "own living educational theory" (Whitehead, 1989) about educational change and action research, and the articulation of new research questions and challenges, identified in Cycle 1, that guided learning and actions of Cycle 2.

DESCRIPTION AND CRITIQUE OF CURRICULUM OUTCOMES OF CYCLE 1

This sub-section is an examination of the curriculum outcomes generated in Cycle 1, derived from the 1997 *Earthworm Project* that focused on the learnscaping concept. A report of these activities, written by Jo, describes what was intended and implemented.[105]

From *Environmental Education at Fernwood State School* (Draft journal article, Cycle 1, 8/5/97)

Our task in 1997 is to turn our wonderful landscaping into learnscaping and to this end we intend developing a series of activities to enhance each of our theme gardens. We are hoping to help the students develop a sense of ownership and have embarked upon a theme of "Explore Outdoor". Early childhood students will explore "Birds" using the Scent and Colour gardens, middle school students will focus on "Marsupials and Monotremes" within the Koala Corridor and upper school students will study "Reptiles and Amphibians" in the Rainforest, Habitat and Aboriginal Food gardens.

Animals, particularly those found within our school and local area, have been chosen as subjects for study. Our major focus is to weave all these into three stories about our learnscaping with the assistance of a storyteller. The stories will be devised by students and will also help to guide visitors along a trail from garden to garden. We are also hoping to link our stories to an existing mural that has lots of Australian native animals all over it. This was created several years ago by two talented young graffiti artists and is already a major focus in our school. This mural would also act as a reminder to the children of our stories.

We are also working this year on an underlying theme of "Care". Each group has a learnscape area to care for. Once again, these are linked to the areas within the school that the children are focusing on, including the courtyard areas directly outside the individual classrooms. Children are encouraged to "care" for their areas by checking sprinkler jets; weeding; pruning (upper school); picking up litter (if any); and monitoring tree growth etc.

Along with the usual responses to their learning in our "environmental" term, such as poetry, craft, letter writing, science and mathematics activities etc, when the Earthworm Project is underway, the children will also be involved in the creation of three "care" quilts that will reflect their feelings about their particular area. Each child will create a 15cm x 15cm patch that will all be sewn together to form the quilt…. The wider school community, including parents, neighbours, council and local schools will also create a fourth "community care" quilt.

These curriculum intentions did become curriculum outcomes. The teachers developed a set of cross-curricula units that were integrated around the chosen animal themes and

[105] A re-edited version, *Stories from Practice: Landscaping to Learnscaping*, was published in the Australian Journal of Environmental Education in 1997.

associated gardens. The care quilts were created and handed over to the Royal Children's Hospital to brighten the wards. There was evidence of children taking environmental actions such as clearing, cleaning and caring for their gardens and play spaces.

In addition, the storyteller and the students, together, developed a series of stories based on the learnscaping gardens. These were later edited into a linked set of three – *The Rainbow Wish*, *Koala Power* and *Rainbow Dreaming*. The following excerpts from two of these stories illustrate the central themes of biodiversity and the role of social action.

Excerpt 1: From *The Rainbow Wish* (Early childhood learnscaping story, Cycle 1, 18/6/97)

The Rainbow Lorikeet flew here and there, and, wherever it touched the magic seed, bushes and trees, shrubs and vines and groundcovers grew. Soon the whole front of the schoolgrounds was covered in beautiful learnscaping.

The students stood back and said "Wow! What magic! Now there can be lots of homes for all of the animals".

And do you know what? There are! There are lots of homes for the animals at the school and the students from the early childhood classes never forget the Rainbow Lorikeet and the day the koala reached into the hollow and dropped the seed for them to plant.

Excerpt 2: From *Rainbow Dreaming* (Upper school learnscaping story, Cycle 1, 18/6/97)

From that day on, the students in the upper school knew that they had to take care of their school. They had to help teach all the students about the environment, and to tell them the stories of the plants and the animals, and the frogs and the Rainbow Lorikeets, if they wanted the spirit of the land to stay healthy and strong, and the environment to stay clean and alive. That's what they do at the school. They all help each other to learn and remember.

An analysis of these stories shows explicit links to the school context. For example, the stories feature school staff, including the groundsperson and principal as characters. Indigenous animals that frequent the grounds, such as koalas and rainbow lorikeets are featured, along with references to native plants that occur in the gardens. Overall, these fantasy tales strengthen social and environmental connections between the school and students' daily experiences while, concurrently reinforcing values, knowledge and actions that promote care and responsibility for the environment. I wrote in my journal at the time in response to these storytelling experiences:

> *The children enjoyed the stories and were engrossed in their telling and retelling. They were particularly effective because they made important links to the gardens and landscapes of the school through use of real people, and real animals and habitats familiar to the children. They motivated the teachers to work outdoors and for the children to care of the gardens.* (Observation notes, Cycle 1, 2/5/97)

There was general acknowledgement that the actions generated in this first cycle helped to enliven the curriculum. The teachers applied new strategies that encouraged them to work outdoors on a range of cross-curricular activities. The students had opportunities for enhanced learning in and around topics connected with the school's environment. In the next section, I expand further on what was achieved. This is followed by a critique, based on my field observations and reflections, of these curriculum actions and outcomes. Finally, these actions are evaluated in terms of the principles and features of critical environmental education that have been highlighted in the literature review presented earlier.

Positive Attributes

The actions in the first cycle illustrated several significant and successful attributes of environmental education. These are summarised below:

- Many opportunities were provided for students to explore their outdoor school environments experientially. These included the *Under Eight's Week* activities, the *Five Star Garden* action project, mathematics learning linked to the *Shape Garden*, and art activities developed for the *Line and Texture Garden.*

- "Environmental messages" were embedded into outdoor teaching and learning, aimed at reinforcing the role of humans in both protecting and harming the natural environment. This was especially evident with the storytelling activities.

- The early childhood classes used an action inquiry approach to investigate biodiversity and bird-friendly gardens in the school, although the exploration of issues was not a strong component in the rest of the school.

- The values of environmental stewardship and collective environmental responsibility were reinforced throughout the storytelling activities and embedded into the environmental stories.

- Some environmental and community actions were taken. These were demonstrated through the allocation, maintenance and improvement of class "care" gardens and the making of the "care" quilts.

- The decision-making processes used in the development of the learnscaping curriculum gave some degree of "voice" to students, especially through the story making activities. Older students were also utilised as peer teachers and guides for

younger students during the *Under Eight's Week* activities. Teacher participation in curriculum decision-making was an espoused value.

- Integrated curriculum approaches were extensively used. "Themes" were the favoured way of delivering such integration. The storythread was also a successful integration device. It helped to make cross-discipline links, links between indoor and outdoor learning, as well as links across year levels.

- The *Earthworm Project* provided focus and motivation for the environmental activities undertaken in the school. It facilitated a whole school approach by integrating a range of curriculum and environmental projects into a one-term event that involved all year levels and all classroom and specialist teachers.

- The school's numerous environmental projects strengthened its school-community links. These included the making of the care quilts, the *Under Eight's Week* activities, and the Koalathon, in which parents and the wider community were regular participants. Parents and community members were also invited to learn about bird-friendly gardens through a student display in the local shopping centre.

In summary, students, teachers, parents and the wider community displayed a high level of interest and participation throughout the range of activities associated with this *Earthworm Project*. There was also considerable utilisation of the outdoors as a teaching and learning resource for "core" content such as Mathematics, Science and English, as well as some environmental learning. There was engagement in environmental activities of one kind or another across the whole school, with curriculum integration being a feature. Overall, the first cycle of this learnscaping project was a curriculum success.

The Limitations

However, reflection and analysis of the outcomes in this first learnscaping project also revealed limitations, two of which were particularly evident. The first was that teachers did not feel skilled or comfortable working outdoors with students. The second was the lack of a socially critical dimension to the curriculum. These are now discussed in detail.

Lack of Confidence in Teaching Outdoors

Even though the central theme of the 1997 *Earthworm Project* was "Explore Outdoor", this was not taken up strongly by many teachers. An interview with Linda, a teacher working with students in the middle part of the school, helped my understanding of the reasons for this. While she recognised that she should use the outdoors more fully and indeed wished to

do so, Linda also commented that she was not comfortable working outdoors and did not have adequate skills for outdoor teaching. In particular, she was concerned about the adequacy of her class management skills outdoors, and that this was an issue for a number of teachers. In her interview she commented:

> *One day the teacher from the local environmental education centre took us around the grounds. He, of course, is a natural and showed us how to take leaves and rub your hands together and smell them. I'd really like to do that, but I couldn't do that with thirty! I could do it with eight, a very controlled group; otherwise we'd end up with no leaves on the trees. They're wonderful activities but I still need that step-by-step guidance to go out, and I'd probably need to ask him again what to do, or ask Jo again "What was that activity?" even though I'd written it down*. (Transcript, Cycle 1, 21/9/97)

Later, in the same interview, she elaborated further on her lack of confidence with outdoor teaching and learning:

> *Actually, I'd probably prefer to use the outdoors more. It's just that I feel comfortable inside with the children. Then, if I am going outside, I'd feel comfortable having the whole class if I was directing it, say telling a story or pointing out some aspect. But if I had to go outside and have different activities, I wouldn't feel comfortable. However, if I had parent helpers who had a certain group each, I would feel comfortable doing that*. (Transcript, Cycle 1, 21/9/97)

Lack of a Critical Orientation

The second limitation was the lack of a socially critical focus to most of the activities. The concepts of education *in, about* and *for* the environment had been introduced to the key teachers involved with the learnscaping project only a short time prior to the commencement of the project. There had been no opportunity to provide professional development for all staff about environmental education and consequently, no chance to discuss concepts and possible teaching strategies. It was little wonder that there was a dearth of teaching and learning activity with a critical perspective. Overall, I identified a number of ways that this lack of a critical orientation was manifested. These included a view of environmental education as biology and ecology, superficial enactment of curriculum integration, an over-emphasis on winning awards, a narrow perception of environmental issues and action, and limited participation in decision-making. Each of these is discussed in the following section.

- **Environmental education equals "green" science**

Several teachers in the school indicated that they equated environmental education with knowledge of the "green" sciences, that is, with nature studies. This perception of what constitutes environmental education influences how environmental education is taught and

what knowledge, skills and attitudes are learned. This is illustrated in this excerpt from Linda's interview:

> *My background knowledge is very limited….When I first arrived at the school, the children were able to tell me about koalas, and they had a great knowledge already – Yr 2s and 3s! They knew more than I did about the habitat, what they needed, how to save koalas. I learnt a lot from the children in the first year, and then I just had to find my own resources to find out all the information they already knew and had learned about.…I prefer languages and art, so I'm still learning how to use the environment. I know some of the other teachers find using the environment a lot easier than I do.* (Transcript, Cycle 1, 21/9/97)

Jo revealed that she also regarded environment education as being underpinned by "green" science concepts and knowledge. In her interview she stated:

> *I like environmental education because I like plants. I like animals and for me it's easy because they're things that are actually there. Instead of talking about "Space" as a theme, you talk about the trees outside and the animals, the value of recycling and stuff, and it's more practical.* (Transcript, Cycle 1, 17/9/97)

Jo also confirmed reluctance on the part of many of the teachers to engage in environmental education, and to utilise the outdoors, because they were not interested in science and/or thought that their science knowledge was inadequate. This was compounded by a general lack of interest in and familiarity with science pedagogy. When discussing options for developing the learnscaping project, Jo commented:

> *We need to make the activities easy enough to do without a lot of scientific knowledge or without having to know the particular plant you are searching for. We don't want to panic people…Make the activities realistic for people who aren't into Science or aren't into Maths, because there's going to be a lot of Maths and Science out there… If we don't make the activities worthwhile for the teachers and the kids, then they're not going to get done. There are lots of good activities out there, but they can take some setting up or they can take some finding. Some require follow through for, say, every Monday for the next four weeks. Like forget it! Do it now, or it's gone! (Transcript, Cycle 1, 17/9/97)*

- **Superficial enactment of integrated approaches**

The extended storytelling activity was facilitated by a professional storyteller with a personal commitment to environmental issues.[106] This served as a sophisticated integration device for environmental education. It offered a non-science alternative to environmental education by promoting ways of understanding the environment through language and the Arts. The stories introduced and reinforced concepts of stewardship and human responsibility towards the natural environment.

[106] The storyteller was a past president of a peak environment group in New South Wales and has continuing close links with environmental groups, projects and campaigns.

However, it appeared that these concepts, with their socially-critical orientation, were not developed further by the majority of teachers. The activities, overall, were inadequate for developing deep understanding of environmental concepts or issues.

- **An over-emphasis on winning awards**

External awards and competitions, especially the national *Earthworm Award*, have been major motivators for engagement in environmental projects in this school, with past successes providing impetus for continuing involvement. However, they also appear to have generated over-enthusiasm for winning, with activities seemingly designed with "the eye on the prize", perhaps at the expense of potential learning goals such as deepening knowledge, attitudes and actions *for* the environment. Jo acknowledged as much in one of our planning meetings, which I later recorded in my meeting notes:

> *The idea of the "care quilts" was a new option added at the second planning meeting. Jo called it a "gimmick" because it was designed to enhance the chances of winning the Earthworm Award because it demonstrated "community connections". The idea was that four quilts would be made – lower, middle and upper classes – and a community quilt for parents and other community member, to demonstrate community education and action.* (Meeting notes, Cycle 1, 13/2/97)

- **Narrow ideas about environmental issues and actions**

The lack of a critical perspective was also illustrated in the ways in which environmental issues and actions were viewed. The main environmental issues studied in the school relate to species conservation. This is understandable given the importance of koalas and koala habitats in the local area, however, it also means that a narrow range of issues, mainly related to conservation, make up issues exploration and the action component of environmental education. For instance, the *Birds and Trees* club – coordinated by Jo and organised for and by students in her class – breed frogs and endangered bird species and maintain a nursery for raising local native plants. There are also recycling activities, especially composting and collecting aluminium cans, which have been ongoing projects in the school, and some student involvement in the maintenance of the learnscaping gardens. However, when asked in interview whether issues such as air pollution or water pollution were discussed, Jo's response was:

> *We've done a little bit, not a lot. There's a program called Waterwatch but because the school doesn't have water going through it, or nearby it's really hard to do that one. Pollution, I don't know much about it myself, so I guess I tend to stay away from these issues. Broader issues are tackled but not as much as the love of nature. The upper school students will look at conservation and things like that but perhaps mainly from my perspective. They wouldn't chop any tree down!* (Transcript, Cycle 1, 17/9/97)

- **Inclusive and participatory curriculum practices not deeply embedded**

Curriculum decision-making in any school can be circumscribed by a range of impeding factors. These include the necessity for tight schedules for action due to internal and external "imperatives", or past habits and practices. In the creation of the "enduring" learnscaping stories, for instance, inclusive and participatory curriculum processes seemed more espoused than practiced. For example, while there was much talk about the importance of generating student ownership of the gardens through the learnscaping project, the story-selecting process was one that limited the majority of students' earlier story-making inputs. This process also overrode some teachers' suggestions for a more inclusive way of selecting the stories. In the end, the wishes of Ian and Jo prevailed. As I wrote in my journal after discussion about how the story selection should occur:

> *While I believe this choice of stories will make for a more cohesive and manageable final story, this decision illustrates the tensions and dilemmas that arise around collaboration and participation. In order to create a story that had good internal coherence, wide student participation was sacrificed, as well as the ideas of other teachers.* (Reflective journal, Cycle 1, 27/2/97)

Summary Comment about the 1997 Curriculum Outcomes

The curriculum outcomes developed from this learnscaping "trial run" were the result of the teachers in the school "adding value" to their participation – developed over a number of years – in award-winning *Earthworm Projects*. As researcher-facilitator in this curriculum project, I sought to understand and analyse existing environmental education practices in the school and to use this knowledge to expand teachers' understandings about environmental education in order to widen the base upon which future learnscaping curricula could be developed.

Thus, my analysis of the curriculum outcomes developed in this first cycle showed two successful program elements, judged on the basis of key characteristics of environmental education obtained from the literature review. These were the development of a whole school environmental story, linking curriculum explicitly to the grounds and gardens, and the broadening of the curriculum content areas used to facilitate outdoor learning – going wider than scientific approaches. Teachers' lack of confidence and skills in working outdoors with students was, however, identified as a significant obstacle. There was also a minimal range of activities incorporating environmental action for most students.

The 1997 project outcomes generally showed that a range of cross-curricular activities that supported students learning *in* the environment were developed and implemented. There

were also activities that supported education *about* the environment, particularly in nature studies. However, there was limited learning that could be interpreted as education *for* the environment. For the project to proceed as an exemplar of critical environmental education I recognised that future developments of the learnscaping project required a focus on teacher professional development. In particular this needed to strengthen teachers' pedagogical practices in working outdoors with students, and to deepen teachers' understandings of critical environmental education principles and practices.

LESSONS LEARNED ABOUT THE PROCESSES OF CHANGE

The previous sub-section described and critiqued the learnscaping curriculum generated in the first cycle of this project. This sub-section focuses on issues concerned with the change processes that led to these curriculum developments. These "process" features centred around four main issues: (i) the fragmented nature of teachers' time and work, (ii) teacher dependence in curriculum decision-making, (iii) limited student participation, and (iv) issues in project leadership. Each is now examined.

Fragmentation of Teachers' Time and Work

A major problem from the beginning of my involvement was finding adequate time to meet with teachers, and for teachers to meet with each other. I had been a classroom teacher in a primary school, and still regularly visited schools in my role as a supervisor of student teachers, and as a parent; however, I was surprised by the escalation in the pace of the day's activities, and the demands made upon teachers, that were revealed through my ongoing experiences in this school. As I wrote in my journal early in the project:

> *A real problem is that it is very difficult to get effective dialogue because time is so fragmented. This meeting was held on a rotational basis with one teacher relieving another. How do people hear a full range of ideas or alternative viewpoints? In the end, key individuals will undoubtedly have the greatest say and their views are most likely to prevail. This is not about pig-headedness – it's about facing the reality that, sometimes, quick decisions just have to be made! Even if intentions are to canvas views, this is likely to slow decision-making and significantly impede momentum. Real conditions make it very hard to actively overcome fragmentation.* (Meeting notes, Cycle 1, 12/6/97)

Teacher Dependence in Curriculum Decision-making

There was an underlying belief that all teachers should be actively involved in curriculum decision-making in the school. However, ideals of "ownership" and participation are not always realised in practice. For example, Ian, Ann, and particularly Jo, were seen as the key people for environmental education in the school. Consequently, key curriculum decisions regarding environmental projects and activities were largely in their hands. The following dialogue from my interview with Jo is illustrative of this aspect:

> **Jo**: *Linda was funny the other day. We came up with an idea, at least I came up with an idea, and I said, "How come you've just gone along with that? Has anyone else got some other ideas?" and she said, "We've been doing Project Club with you for so many years, we just do as you tell us" and I thought, "Oh, my God!"*
>
> **Julie:** *Do you see that as a problem? It's almost dependency.*
>
> **Jo:** *Exactly!* (Transcript, Cycle 1, 17/9/97)

This exchange exemplifies teacher dependency in relation to curriculum decision-making in environmental education. The teachers' general lack of knowledge and skills in environmental education, together with their lack of confidence in working outdoors with students, reinforce this dependency pattern. The teachers have effectively handed responsibility for environmental education to Jo and, to a lesser extent, to Ann and Ian. This situation has reinforced Jo's position as the environmental education "authority". By this action, the teachers have allowed themselves to become further deskilled and disempowered in relation to environmental education, which promotes further dependence on the key people. It would seem that this "cycle of dependence" can really only be broken by up-skilling the teachers through professional development.

Limited Student Participation

The teachers' lack of understanding of (critical) environmental education approaches also translated into a lack of appreciation of students as curriculum owners and decision-makers. There was an espoused intention for students to have ownership of the grounds and gardens, and that the learnscaping curriculum would contribute to bringing this about. The reality, however, was that the teachers did not have the repertoire of teaching and learning approaches that was conducive to giving students significant ownership of their learning. The following journal entry illustrates this:

> *I sought to clarify the purpose of the learnscaping project. It was reiterated that the project was about student ownership of the gardens so that they would take responsibility, have empathy with, and care for the plants and animals; learn that they share the environment with other life forms; acquire pro-environment attitudes; learn practical skills to look after the gardens. There seems to be a mismatch between these aims and the process for achieving them, though, as students have not been consulted at all. If the project is about student ownership, then the process must include them.*(Meeting notes, Cycle 1, 13/2/97)

Nevertheless, the teachers involved in planning the storytelling part of the learnscaping project were receptive to ways of enhancing student ownership. This was evident at one of our early planning meetings:

> *We had some fruitful discussions about ways to create student ownership. I suggested having a package or letter arrive for a class, as a "hook" into the story. Creative/dramatic devices like these can be very powerful for engaging children's interest and develop their*

> *ownership. It was also suggested that the librarian, a very effective storyteller, could be brought into the process. Overall, I felt pretty happy with the meeting as, during the course of the 1 1/4 hours, we had moved from a framework that appeared pretty "top down" to one where the potential for much wider involvement and ownership of ideas was recognised and being planned for.* (Reflective Journal, Cycle 1, 13/2/97)

In general, my observations and discussions with teachers revealed that the use of participatory teaching strategies was somewhat absent from current pedagogical practices in the school. The deep meaning of children's participation and ownership, as discussed by Hart (1997), requires a major reconceptualisation of educational beliefs and practices. This is a much larger task than the learnscaping project could achieve by itself. An assessment of the level of students' participation at this stage of the learnscaping project indicated that it was around Level 3 or 4, of the eight possible levels on Hart's "Ladder of Children's Participation" (Figure 4.4).

Hart describes Level 3 as "tokenism" or "non-participation" – a form of involvement where children have a voice but little or no choice. Level 4 is "assigned but informed" participation. Hart considers this to be the lowest level of genuine participation where events, festivals, parades and other mass assemblies are used as a first step in enabling children to see that they can have an impact on their world. At this level children may often be assigned to catalyse the actions of adults by educating them on an issue. However, Hart notes that "social mobilisation alone achieves very little in the democratisation of children. These efforts carry simple messages from the top down – that is, from adults to children – and have only a short-term impact" (Hart, 1997, p. 43). With patterns of participation seeming to fit those of Level 3 and Level 4 at this stage of the project, significant changes are needed before Level 8, where "child-initiated, shared decisions with adults" (Hart, 1997, p.43) become the norm.

In summary, authentic student participation in decision-making and gaining a sense of ownership of the gardens was significantly constrained.[107] Further investigation and reflection indicated that barriers to students' participation stemmed from limitations in teacher's pedagogical practices, which in turn stemmed from limitations or omissions in teachers' theories about education. In particular, there seemed to be an absence of critical education theory, philosophy, and practice which, if present, could be expected to lead to much stronger levels of student participation in their own learning.

[107] However, there were some pockets of strong student participation, for example, in the "Five Star Garden" project and the range of projects connected with the *Birds and Trees Project Club*.

Issues in Project Leadership

The final issue that emerged in relation to the processes of change in this learnscaping curriculum project concerned the leadership of the project. I had started the study with the idea that leadership needed to reside in the school, and that my role was primarily to be one of support and facilitation. However, it became apparent as time passed that Jo, the most likely person in the school to take on such a role, did not feel comfortable assuming such as position. On a number of occasions she stated that, being the "expert" because of my background and skills in environmental education, I was therefore the "best person" to lead the project. It took considerable time and discussion for us both to recognise each other's perspectives in terms of our respective backgrounds and capabilities. As a complete novice in relation to the school context, I did not want to lead the school's project, while Jo felt she was a novice in terms of environmental education, and therefore had the same reticence.

However, for my part, while I wished to avoid becoming the overall project manager, I also did not want to diminish my potential contribution. Ideally, I wanted a structure that developed shared leadership, that built on Jo's experiences and contextual understandings, and that used my knowledge and skills in environmental education. Over the course of this first cycle, this did develop to some degree. However, a collaborative model of project management was far from being established by year's end. I was growing anxious about the inertia in the project in the latter part of the year and I saw that this was largely due to lack of clarity about project leadership. Thus, I resolved to reformulate my leadership approach before Cycle 2 commenced in the early part of 1998.

In summary, my analyses and reflections on the processes of change in the first cycle of this project identified four key issues that impacted upon the pace of change and the scope of the project. They were: the impact of the fragmented nature of teachers' time and work, teacher dependence in curriculum decision-making, limited student participation, and issues of project leadership. Nevertheless, the identification of these issues provided pointers that assisted in the ongoing development of the project. I finished the year realising that this study was much more complex than previously imagined.

I explore the nature of these complexities in the following section, and, through the ongoing processes of analysis and reflection in combination with my explorations of the research literature, was able to clarify what I had learnt during my many "field" experiences over the year. As a result, all sources of data – experience, literature and reflection – assisted in the development of my personal theory-making about educational change and informed my thinking and actions into the second cycle.

CREATING MY PERSONAL LIVING EDUCATIONAL THEORY

This final sub-section of the overview of this learnscaping project articulates this theory-making. Essentially, this is a synthesis of my learning in the first cycle of this collaborative project, reformulated into personal living educational theory (Whitehead, 1989). This has two parts – a summary statement about the project after Cycle 1, and a set of initial propositions about aspects of facilitating educational change and the conduct of action research in schools, derived from the totality of the research experience.

A Statement about Complexity

The central, all-encompassing idea I was left with after completion of Cycle 1 was that the project was significantly more multifaceted than I had anticipated. At the beginning, I expected that I would be involved in a project that would last for little more than twelve months. By the end of 1997, however, I came to realise that the project had barely begun. It was far less straightforward than it appeared and it seemed that I was going to be involved for much longer than anticipated. Indeed, this seemingly straightforward project had become highly complex.

In many ways, the process of action research itself created and added to the complexities. The use of reflection to deepen learning about the context and to promote critical reflection on what was observed and implemented, took time away from the "real" task of writing a learnscaping curriculum. Instead of moving the project towards greater clarity, these processes made the project "fuzzier" and more uncertain as the year progressed. Yet, without such processes, it is likely that the project would have stalled completely, and, perhaps, have even been abandoned. Exposing the barriers to implementation, and understanding the blockages to progress, became the basis for new knowledge and new actions. Hence, the explorations of events, relationships, plans and first actions enabled more appropriate and better focused actions to emerge later. In summary, action research played a contradictory part in the development of the project. By revealing complexities in the school and the project, it also simplified the task by focusing attention on strengths and shortcomings. This knowledge was then used to retrieve the project, by building on its strengths and by specifically addressing or, at least, ameliorating the limitations. As a consequence, the project regained momentum and moved into its second cycle.

Propositions about Facilitating Educational Change and Conducting Action Research in Schools

The second aspect of my personal theory-making was a set of five propositions about facets of facilitating educational change and the conduct of action research in schools. In these

propositions, I move my thinking beyond the immediate context of this school and this project to a broader level of theorising. This is my living educational theory distilled from my "lived experience" of the project's first cycle. In positivist research, these propositions would most likely be referred to as "research findings" or "conclusions" and would most likely be presented as evidence-based, authoritative statements. However, the "findings" in this study are much more tentative, open to deeper analysis and further clarification, and possibly even rejection in the light of further experiences, actions and reflections. As such, they are not clear or final statements about the results of the research. Rather, as Dick (1993) declares, they show that "less fuzzy" understandings were beginning to emerge, awaiting further refinement in later cycles. The six propositions about facilitating educational change and action research are now outlined.

Proposition 1: ***Develop Deep Understanding of the Context***

It is important to develop general and specific understandings of what makes a school "tick". This includes building knowledge of its history, culture and prevailing norms; identifying its achievements and why they work; and determining the nature of its school-community connections. Much of this kind of knowledge is generally available in a school. However, developing in-depth understandings that help identify issues, dilemmas, barriers and opportunities can only emerge from regular contact and interactions over an extended period, using a variety of data sources and a range of informants.

Proposition 2: ***Get to Know Internal Relationships and Power Structures***

Seek to develop knowledge of internal relationships and power structures in the school. This entails the researcher becoming acquainted with as wide a group of staff members, parents and others, as is possible, in order to gain a range of perspectives. The principal's leadership style needs to be understood as this influences the nature of many other relationships in the school. A researcher needs prolonged involvement in the setting in order to understand the nature of professional and personal relationships and how these might help or hinder innovation and change.

Proposition 3: ***Develop Relationships of Trust and Mutuality***

Get to know the people with whom the researcher is working closely. This requires regular, face-to-face contact, though email communications were helpful in this project, also. Building trust is also enhanced by keeping appointments and ensuring that tasks are completed. A researcher needs to be open to ways of involvement that are outside the specific parameters of the project. This includes, for example, attending school concerts,

contributing your own “patch” to the quilt, or acting as referee for a funding submission. The importance of committing time and energy to building trust and respect cannot be understated, as all participants draw strength from these relationships. They also provide the “glue” that keeps a project together, especially when it is in danger of falling apart.

Proposition 4: ***Seek to Understand Teachers’ Theories and Dilemmas***

Understanding of teachers’ theories about education and their preferred pedagogical practices is necessary if one hopes to build new knowledge about teaching and learning. This knowledge can be gleaned, to some extent, from observation of teachers “in action” and examination of teachers’ plans, and helps to give purpose and direction to the development of new tasks and interactions. Equally important, showing understanding and empathy for the complex and diverse nature of teachers’ work is crucial for building the trust and rapport needed to keep the project working.

Proposition 5: ***Anticipate Clarity and Confusion***

Understandings about the school, the people, and the project emerge slowly through numerous observations, meetings and interactions. The periods of miscommunication, the diversion of energies, and the emergence of new dilemmas, create both confusion and focus. Participants need to be flexible and responsive to the constant changes but need to also be able to maintain some level of motivation even during times of apparent inaction. Keeping in regular communication is an important contributor to maintaining momentum.

Proposition 6: ***Appreciate the Importance of Action Research Leadership***

Inertia in a project can arise from ambivalence about leadership. Some deep and early problematising about leadership and facilitation might prevent, or at least ameliorate, a loss of energy. It is suggested that, as part of ongoing research and reflection processes, research into facilitation and leadership practices should be considered. Overall, research-facilitators need to balance their time and energies between deepening contextual understanding, building relationships, researching project “content”, undertaking critical reflection, building personal theory, and maintaining momentum in the project.

NEW QUESTIONS AND CHALLENGES

Cycle 1 ended with a meta-analysis examining the cycle and the development of personal theories about educational change and the conduct of action research. It also concluded with a set of “less fuzzy” guiding questions which were developed in response to the issues and dilemmas that emerged as the study proceeded. These questions were:

- *What has gone wrong with the project?*
- *Can we/ how can we get the project "back on track"?*
- *What are the characteristics of an effective facilitator?*
- *How can curriculum be developed collaboratively to gain maximum support for change and innovation?*

Clarifying my perceptions, analysing and re-analysing data, and seeking answers to these questions occupied a large proportion of my time while the collaborative part of this curriculum project was suspended for the six-week Christmas/New Year holiday break. The new understandings that eventually emerged from this intensive period of research and critical reflection were pivotal to determining the actions that developed in the second iteration of this project. These are described in detail in the chapter 5.

Chapter 5: Learning in the Second Cycle
Down to work!

INTRODUCTION

In the previous chapter, I presented and examined the key events, processes and outcomes of Cycle 1 of this action research. This chapter continues the research journey, examining Cycle 2. Whereas Cycle 1 primarily involved developing understanding of the project and its context, this second cycle constituted a range of curriculum actions culminating in the first draft of *Learnscapes Alive*. This chapter is structured in the same way as chapter 4. The first section provides a narrative of events, discussion of data processes and protocols, and analysis and reflection of each phase. Section two contains the literature review relevant to this cycle, and could be read first to maintain the flow of the research narrative, while the third section provides a meta-analysis of the whole of the second cycle.

CYCLE 2: DOWN TO WORK!

Figure 5.1 provides a snapshot, derived from Figure 3.4, of the six phases of Cycle 2 and shows how actions and reflections developed in Cycle 1 helped to redefine the project early in Cycle 2. It also shows that professional development workshops for teachers were an integral part of this second cycle and that these culminated in the teachers writing their own learnscaping curriculum activities. Embedded within each of these phases was continuation of data gathering, analysis, interpretation and critical reflection which helped inform the study as it proceeded and which further developed my own living educational theory.

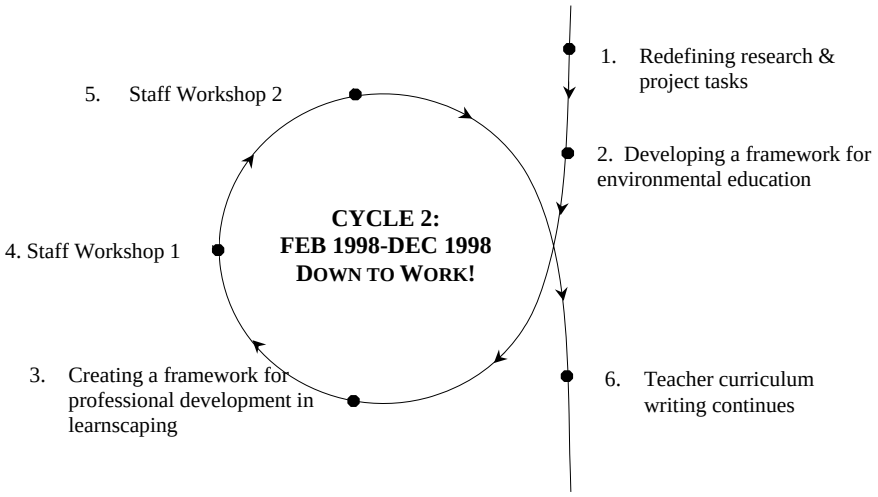

Figure 5.1. The six phases in the second cycle of this action research.

PHASE 1: REDEFINING RESEARCH AND PROJECT TASKS (DEC 1997-JAN 1998)

The previous cycle finished on a note of exasperation because of the inertia that made the project moribund by year's end. In Term 4, I had maintained some interactions with the school – occasional visits, emails and an interview session with Ann – but the overall lack of inputs of time and energy into developing the learnscaping project was very frustrating. This frustration related to the fact that I now had time to advance the learnscaping project but my timeframe did not mesh with that of the school as it moved into end-of-year activities. Being unable to engage much support and interest for the project, I subsequently began to suffer doubts about myself as an action researcher and even about my continuing involvement in the project. The following excerpt from my research journal illustrates my thoughts and feelings during this period:

> *At the end of 1997, the school was planning for the end-of-year concert, another BIG EVENT! This was all-consuming with no likelihood of getting far with the learnscaping project. Consequently, the end of the year saw me quite frustrated. I felt the project was going nowhere. I even consulted my PhD supervisor about quitting this site or adding another to ensure enough data. Fortunately, he was not enthusiastic about this and helped me see that I had, indeed, achieved quite a lot, especially in establishing relationships, in learning about the school context, in setting directions, and in data collection. I could see that this was so, and decided to continue.* (Reflective journal, Cycle 2, 15/1/98)

Fortunately, this period of self-doubt did not last and, after a short break, I became re-engaged with the project and its challenges. I was keen to understand why momentum had been lost and what steps could be taken to remedy the situation. The questions developed at the end of Cycle 1, and repeated here, shaped these inquiries:

- *What has gone wrong with the project?*
- *How can we get the project "back on track"?*
- *What makes an effective facilitator?*
- *How can curriculum be developed to maximise support for change and innovation?*

As I began to think about and search for answers, two additional questions were added to the set. These were:

- *Can I be both an "expert" and a collaborative partner in this project?*
- *Has the purpose of the project changed?*

Because opportunities for working on the collaborative part of this project were not available, these questions focused my personal research activities over the next two months, leading to a period of intensive reading. In hindsight, this would have been beneficial much earlier as some understandings and solutions to the difficulties that had arisen in the study were revealed in the literature. However, my absorption in other facets of this dynamic and evolving research project meant that I was unable to dedicate time to investigating these issues as the problems were arising.

A key area of literature that I investigated to help me understand and solve the problem of an apparently "failing" project included critique of school-based environmental education, explored later in this chapter.[108] I also examined literature about group facilitation, as I thought that perhaps issues stemmed from my skills in this area. However, after reading relevant literature,[109] I affirmed that my practices in group facilitation were adequate. Instead of being concerned with internal "micro" group processes, a review of literature about the conduct of action research[110] showed that what was lacking was leadership at the "macro" level of the project. This crystallised into recognition that project leadership was an issue that needed active attention if the project was to advance.

This led me to then rethink the kind of action research that this study would utilise. I had anticipated that it would develop into participatory action research (PAR) as advocated by numerous education and community development writers.[111] This form of action research (as discussed in chapter 3) has developed from critical theory and is recognised as a highly inclusive and "emancipatory" form of action research. My expectation had been that members of the school community would "own" and lead the project. As an outsider, I anticipated that I would help facilitate this and support their leadership.

However, I came to understand that such an approach to leadership was not going to work. Jo was the most likely person to lead the project because of her background, skills and interest in environmental education. However, the high day-to-day levels of teaching and administration duties expected of a classroom teacher, her personal reticence to lead, combined with a lack of detailed knowledge about critical environmental education,

[108] Significant readings at the time include Posch (1994) and Walker (1995). Later, while writing the literature review for this chapter, an article by Nixon, Sankey, Furey and Simmons (1999) added insights and new dimensions to these earlier ideas.
[109] This included Dick (1991); Office of Global Education (1989); Study Circles Resource Centre (n.d.).
[110] Review of this literature appears in chapter 3 under the heading *Issues, Dilemmas and Paradoxes in Conducting Action Research.*
[111] Some PAR advocates in education include: Atweh, Kemmis and Weekes (1998), Elliott (1998), McTaggart and Garbutcheon-Sing (1988), Winter (1996). Wadsworth (1998) is an advocate of PAR in community contexts.

conspired to limit the levels of active leadership and organisation necessary for participatory action research. Reluctantly, I began to focus on my own leadership potential.

I came to the realisation that if the project was to gain momentum, I would have to move it forward. This meant rethinking my role in the project and taking a more active part in organisation and leadership than originally planned. This decision reflects Stoeker's experience of working with community groups. He maintains that tradeoffs between democracy and efficiency in a project are sometimes necessary and that this "is no different than the tension between democracy and efficiency that afflicts any community organising/development project" (1997, p. 14). This discussion by Stoeker was instrumental in assuaging my concerns that I had failed to "properly" implement emancipatory research.

In fact, Stoeker (1997) questions the practicality of some of the core tenets of participatory research. He queries the belief, in particular, that the research question should be generated by the community. He notes that many projects would not happen without the initiative of someone outside the immediate community, such as a university researcher, who has the time, skill and commitment to catalyse the research task. This is because community members (in this case, teachers) have important and pressing professional duties to perform that preclude or restrict such additional work. I also came to the realisation that I would have to compromise on my commitment to local ownership and full participation in the project if it was to advance. I also came to recognise that I was the best-placed person to carry out the project facilitation. The reality was that, as an academic, I *did* have more time, motivation and opportunity for this role than members of the school community, as well as practical skills and knowledge expertise in action research and environmental education.

Consequently, in recasting my role, I became more pragmatic and less ideological about participation. This meant confronting the tensions between being seen as the "authority" or expert, while also seeking to broaden participation. However, this struggle was a better option than having the project fail to thrive. From this point onwards, I became more effective as a researcher-facilitator. Ambiguities regarding the purpose of the project and how best to proceed began to dissipate as I resolved uncertainties about my role. I became re-energised and recommitted to helping create a learnscaping curriculum for the school.

Thus, through seeking answers to my research questions through reviews of literature and through examining and re-examining collected documents, interview transcripts and other data collected in 1997, I also came to a renewed understanding of the project's purpose.

While the project was broadly about the development of a curriculum based on the schoolgrounds, the data and the literature strongly indicated that this needed to be set within a framework that included two additional elements – teacher professional development and environmental education policy development. In relation to the former, some basic understanding of environmental issues and concepts, and an appreciation of the fundamentals and principles of environmental education seemed necessary. For the latter, a framework that tied together the many disparate environmental actions, projects and other curriculum activities – including this project – that came under the banner of environmental education seemed an important area for policy development within the school.

Therefore, in early January 1998, in the month preceding the beginning of a new school year, I prepared a draft environmental education framework for the school's activities. This was based on the perceptions, evaluations and insights I had gained throughout 1997. My hope was that this document would provide a starting point for discussions when school resumed; that it would help re-invigorate the project; that it would serve to further clarify the project's purpose; and that it would affirm my new leadership role within the project. This draft document was posted so that it would arrive at the school for consideration in the second week of the new school year, just after initial "settling in".

Research Processes and Protocols

The "breathing space" afforded by the school's long summer vacation period presented an opportunity to visit and revisit the data I had collected during Cycle 1. I re-read and re-analysed interview transcripts to review thematic categories and to uncover new ones. I also re-examined meeting notes and journal entries with the aim of confirming themes and seeking new insights. These triangulation procedures gave strength to my emerging interpretations and plans for actions. Combined with insights from my ongoing reading of the literature, this enhanced my confidence in the validity of the interpretations I was making about the school's environmental education practices and how best to proceed with the project. However, I was aware that the real credibility "test" lay with acceptance by the school community of these interpretations and plans. They had provisional status only until they had been discussed and critiqued by staff from the school.

The other major focus for reflection during this school holiday break concerned re-assessment of my role as project facilitator. This had an important role in the validity of the research process. As I discovered later, Lincoln (1997) has identified this as a new but crucial element for assessing rigour and quality in the emerging, postmodern forms of social science that include participatory research. She suggests that traditional assessments

of validity (such as triangulation and member-checking), used on their own, are inadequate for dealing with the complexities of participatory research. Intuitively, from my own problematic issues with project leadership, I had come to realise the importance, also, of assessing facilitation processes as part of determining research rigour, a process that led to my decision to become actively involved in organising and leading the project.

Analysis and Reflection

This first phase of Cycle 2 was a time of deep reflection and critique, as the following account from my research journal illustrates:

> *The Christmas break provided release from engagement with the school and gave me opportunities to explore other aspects of the research that I had not had time to do. These included examining the literature on whole school planning, cross-curricula approaches, learnscaping and the educational use of schoolgrounds, with a dabble into literature on school/ educational change. I also drafted a first chapter of this thesis, which was particularly useful as it gave me an appreciation of the scope of this doctoral study. Usually this writing occurs prior to a researcher entering the field, but action research follows the life of the context rather than the life of the researcher.*
>
> *This pause also enabled examination of issues in action research and qualitative research. Entering into a research project with a timeframe not determined by the researcher meant that I did not get the chance to clarify many aspects of research process – particularly my researcher role. This "breathing space" enabled me to contemplate this more fully, ultimately leading to a significantly changed and more realistic view of my role in the project. I realised that I needed to be more proactive if the project was to move forward. If I waited to be invited to do things they wouldn't happen. Therefore, I took the initiative and put some ideas on paper and wrote to Ian about possible future directions. I figured that if there were proposals to respond to, this would stimulate discussion with the potential for moving things on. This would also help me develop a clearer role and purpose.* (Reflective journal, Cycle 2, 15/1/98)

In resolving to become more active as a facilitator and leader in the project, I also had to rethink the role of school members. I remained committed to principles of democracy and inclusivity overall. However, instead of assuming that Jo and other key personnel would co-share facilitation and decision-making, I realised they could be participants in equally important, but different ways, such as contributing their local and specialist knowledge of the school and its community. This reconceptualisation also encouraged me to explore more dynamic roles in the project for more teachers. Previously, I had mainly been working with a small "expert" group of staff. Now, I saw opportunities to involve all teachers in the curriculum developments and to view this process as professional development.

Inevitably, these role changes led to revision of my ideas about the kind of action research in which I would be engaged. Rather than working in a model of participatory action research (PAR), as I had anticipated, the day-to-day constraints and realities of the context

reshaped the research into a form that I later called “facilitated action research”. Overall, this shift involved compromises in terms of ownership and inclusivity but also meant that the inertia in the project could be overcome and momentum regained. Without this reconceptualisation, the project may well have stalled after its first year, and perhaps not been revived.

PHASE 2: CREATING AN ENVIRONMENTAL EDUCATION FRAMEWORK (TERM 1, 1998)

The draft environmental education framework, and associated discussion notes, that arose from the reflection phase were sent to the principal at the beginning of 1998. These were then discussed with him at my first meeting for 1998. The purpose of this document and discussion was twofold. First, it reviewed existing environmental education practices at the school by highlighting the following issues:

- The number and nature of environmental projects;

  I had not seen evidence, for example, of “building on” from year to year or from project to project in terms of broadening and deepening students’ knowledge, skills and attitudes in relation to environmental understandings.

- Most projects and activities focused on “green” environmental issues;

  This meant that issues such as water and air pollution and conservation, transport, waste management issues were not adequately addressed.

- The *Earthworm Projects* clearly demonstrated the capacity of the school to mobilise its community;

  With such a supportive base, parents and others could be encouraged to actively participate in the learnscaping curriculum project developments.

- Teachers and students in the middle grades in the school seemed to be less engaged with environmental education than were those in upper and lower grades.

  This is an area of curriculum development requiring special attention.

The findings of this review of environmental education practices in the school indicated areas and issues for focused attention. However, they also indicated the strengths upon which these efforts could be built. In keeping with my desire for expanded participation in the learnscaping curriculum planning process, I suggested that representation on the

Environment Committee also include members from the under-represented groups – namely teachers in the middle grades, and parents.

The second purpose of the document was to illustrate how current environmental education activities could be drawn into an integrated framework. I presented a model to show four possible strands for building upon and giving cohesion to these activities. Central to the model was a strand providing an overarching philosophical base to guide all environmental activities in the school and to strengthen their educative focus. The four stands were:

***Strand 1*:** Shared development of a set of "guiding principles" for a whole school approach built upon the concept of "eco-school".[112]

***Strand 2*:** Maintain the learnscaping curriculum project to continue the work commenced in 1997.

***Strand 3*:** Continue participation in the annual *Earthworm Awards* to build on successes and mobilise community support.

***Strand 4*:** Focus attention on issues such as energy or water conservation in the other environmental education projects that involve teachers throughout the year.

The first meeting in 1998 with Ian, Ann and Jo was illuminating, and ultimately a very positive experience. The following lengthy section from my journal illustrates this:

> *I met with Ian, Jo and Ann to discuss my letter and draft "action plan" and admit to feeling rather apprehensive. I wanted to explain my critique but didn't want to lose support, especially as my personal relationships, though good, were still rather tenuous. Fortunately, there was general agreement with what I had stated, with Ann re-emphasising the need for an overall philosophy.*
>
> *Jo's reactions were interesting. She challenged aspects of my critique. For example, in regard to the idea of "eco-school" for Fernwood, Jo thought this concept did not adequately express Fernwood's interests in environmental matters and that the concept focused too much on "brown" issues and not enough on "green" ones. Her argument is that Fernwood IS on about "green" issues; that this is what the school wants to be recognised for; and that green issues ARE the major environmental challenges for the school, situated, as it is, in the middle of a koala habitat. While I endorse this standpoint, I would also like to think that this "green" view could shift at least a bit towards recognising the relevance of other issues, such as water use in the school, or waste generated by the tuckshop, as also being relevant local issues worthy of examination.*

[112] This is a whole school approach to environmental education which seeks to integrate a school's curriculum and management practices. Originally sponsored by UNESCO, it has been supported in Australia by the New South Wales Department of School Education.

> *Jo also didn't like the way I had allocated different sections of the school to specific kinds of environmental education i.e. P-3's focusing on education* in *the environment; middle school focusing on education* about; *and the upper school focusing on education* for *the environment. She believed that these could, should and do happen at all levels. I absolutely agree! In a way, I put this in to "test" where thinking was at in relation to the use of empowering approaches to environmental education and was really pleased that this view was endorsed.*
>
> *Jo also queried my view that the middle grades needed its own focus and/or person to join the school's "environment" team. She thought that these teachers were happy with current arrangements, that is, doing what they were asked rather than being part of the planning group. On this point I don't agree. Perhaps it's seen as too much hassle? personality differences with staff? giving away authority?*
>
> *Anyway, once Jo's criticisms and queries had been made and I had acknowledged these, and it was understood that I was presenting ideas for discussion rather than prescriptions, we both relaxed considerably. Overall, I left the meeting feeling pretty comfortable, and that we could again move forward with purpose.* (Reflective journal, Cycle 2, 25/2/98)

Due to some confusion about meeting times we were joined by another group of teachers already underway with plans for the 1998 *Earthworm Project*. The teacher overseeing the *Tidy Schools* project presented the plans that she had prepared for this award scheme's entry. Many aspects of the *Tidy School* project derived from the 1997 *Earthworm Project*. Her plans also incorporated elements of the "guiding principles" that I had just been discussing with Ian, Jo and Ann. It was subsequently agreed that the *Tidy Schools* project should not focus only on litter as in past years. Rather, it should concentrate on developing the interest and capacity of the students to be "caring stewards of the earth" through looking after their "care gardens". As I wrote in my journal:

> *I could see that this Tidy Schools project, rather than being another ad hoc project, was fitting into the overarching philosophical framework for environmental education that I had proposed and was making a link to past environmental projects.* (Reflective journal, Cycle 2, 25/2/98)

However, the most interesting part of the meeting followed when discussion of the *Tidy Schools* project led to consideration of the planned 1998 *Earthworm* entry – *Project Stepping Stones*. Jo had presented staff with her overview of this in the previous week. This included a detailed summary of "environmentally-related" concepts, drawn from the Science and Social Studies syllabuses that could be developed through the project, for each level of the school. However, of greater interest were the statements in this overview that expressed why the project and theme had educational value. After listening to and then viewing these written plans, I later wrote in my journal:

> *Jo had extensive notes from a range of sources that were a rationale for EE in the school, what EE is, with information about education in, about and for. This was the philosophy and underpinnings that had been missing in previous projects, along with some principles for environmental education! I began to see that I had "made a difference" through my inputs and leadership over the past months. The ideas presented were from the framework I had recently sent and from other resources and materials that I had been passing on to Jo over the past year…. In fact, in the same meeting that proposals for a "whole school" framework were presented for discussion, the teachers were also endorsing its guiding principles!*
>
> *It was agreed that I would work more directly with Jo on these principles (these were now Jo's, not mine!) in order to get these ready for further review and discussion. I was over-the-moon about this! This was the action that I had hoped would come from this meeting and confirmed that I had made the right decision in seizing the initiative with the project. At last, I had negotiated a clear role for myself that would make the most of my skills and expertise and would also move the school closer to its goal of developing a useful framework for its EE activities overall, as well as guiding the learnscaping curriculum developments.* (Reflective journal, Cycle 2, 25/2/98)

From this vital meeting, I took Jo's concept map and planning notes for the *Earthworm Project* and reorganised them into a short document that could be used as an overview for a whole school environmental education plan. I forwarded this to Jo and anticipated that she would rework it further. However, when we met again, the document was returned "clean", but formed the basis for productive discussion on the project's direction. In summary, while I saw the need for a whole school environmental education framework, Jo wanted the focus to remain on the *Earthworm Project* and the learnscaping curriculum project.

This discussion again raised issues about my role in the project. Having chosen to become more assertive in order to give momentum to the project, I realised I was now trying to impose my own perspectives too firmly. This "error of judgement" was nipped "in the bud" by Jo who focussed attention back to the learnscaping project rather than the environmental education framework – a timely reminder that the project belonged to the school, not to me. Overall, this discussion helped me to refocus on the school's expressed needs rather than on my perceptions of their needs. As I wrote in my journal:

> *This meeting narrowed the focus from a broad whole school EE framework that I had been conceiving, to a greater emphasis on the learnscaping component of this. In some ways, I was very relieved, as this would be more manageable, though I still think it is important to consider an overarching framework, too. However, this is simply outside my brief, so I had better get on with the job as first discussed!* (Reflective journal, Cycle 2, 25/3/98)

The focus therefore shifted back to the development of the learnscaping project and how the materials that were developed might be presented. Jo had conducted considerable research into the ways that other schools had presented their school-based environmental

education curriculum materials, and offered some alternatives. Thus, between the two of us, we developed a format that we thought would be suitable.[113] We also discussed the attributes for the finished product that we thought were important. These were that the final document should be:

- *user-friendly with maps/diagrams/illustrations, that is, materials that are easy to read, copy and add to;*
- *in a binder that is a "starter" kit for teachers;*
- *accentuates the educational value of the outdoors. (Jo thinks some teachers don't "get it" and are not comfortable in the outdoors, both personally and with groups of children);*
- *provides strategies for outdoor group management;*
- *has activities linked to specific gardens;*
- *provides information relevant to each garden area, to develop a knowledge base and to provide bits of interesting trivia;*
- *links activities to key learning areas such as Maths, Science and so on;*
- *incorporates the stories developed in 1997 to provide curriculum continuity, integration and "spring-boarding" to children's environmental literature and to support links to key learning areas*. (Email to Jo, Cycle 2, 14/5/98)

With this discussion, I felt that we had made some important decisions. For the first time in fifteen months, we were able to establish some firm, clear directions for the project, after having reached a shared understanding of what was wanted and what was possible. Now we both hoped for, and anticipated, some real action in the learnscaping curriculum project.

Research Protocols and Processes

In this section, I continue discussion of the two key issues of research process that dominated Cycle 1 – research validity and project facilitation – and which remained significant in this phase. As discussed in Cycle 1, the internal triangulation strategies that I employed in data collection and data interpretation helped give me some confidence in the interpretations and analyses that I was developing. However, it was not until I had had these critiqued and sanctioned by school-based participants, and the utility and feasibility of resulting proposals for action endorsed, that I felt that my processes and plans had validity and rigour. As Nunneley et al. (1997) propose, for research processes that have an "action" imperative it is important to test the worthiness of interpretations, ideas and proposed actions by having them validated by the participants in context. Only then, they state, can the research processes demonstrate the necessary vigour as well as rigour.

[113] This was a binder modelled on the *Hands-on Learnscapes: Environmental Education Learning Program* developed by the Harwood Island Public School in New South Wales.

The process of "testing" the worthiness of interpretations was first enacted by Jo's challenges of my interpretations of the school's environmental education activities. Her critique led to fruitful discussion and a renewed sense of collaboration. At the second meeting where I again presented my interpretations, ideas and plans for critical examination, there was also strong critique. This helped me to recognise that I was attempting to impose my own ideas about the importance of an overarching environmental education framework. Member-checking and review by school participants ensured that the project developed according to the school's agenda for innovation rather than mine.

The second issue of action research process that, as before, was significant in this phase concerned my role as researcher-facilitator. Having determined that I needed to demonstrate increased leadership in the project, my experiences indicated that I had taken this idea too far. I was now in danger of "hijacking" the project. This understanding increased my appreciation of the difficulty of conducting participatory research, even for someone committed to practicing inclusivity.

As well as these two recurring issues, a third issue in relation to research process emerged in this phase. This related to my desire to democratise the writing process of this report as well as the decision-making processes inherent in this study. As Winter (1996) suggests, the collection of multiple and alternative viewpoints from many participants enables a report of a collaborative project to also become a collaborative portrayal of its actions. However, by this stage of the study, I came to understand that I was not going to get significant written feedback from teachers, either to assist in triangulation or to help create a collaborative written account. Teacher interest in journal writing and written critique was also simply not evident. As the very least, I had hoped that Jo and other participants would make jottings on documents to provide some "pithy" comments or apt quotes. With this realisation I then increased my efforts to secure verbal critiques and accounts through interviewing and recording events and conversations "on the run" (Wadsworth, 1991). As the project proceeded, however, the increasing use of email helped to overcome this issue to some degree as it provided an additional way of collecting information and reflections, especially from Jo. Consequently, I have had to settle for this more traditional, researcher-focused written account.

Analysis and Reflection

In this section, I analyse at a generalised level, and reflect upon, the significance of key events and interactions in Phase 2 of this second cycle. Overall, this phase was pivotal in the life of the project as it was during this time that a common understanding about the

purpose of the project was finally reached. Although I was familiar with literature[114] that indicated otherwise, I had not really anticipated that this would take over twelve months. This is because I had underestimated how long it would take to build relationships and trust, and contextual understanding of the school, in order to fully appreciate the opportunities and constraints on change and innovation.[115]

Another insight gained during this phase related to the "risk" in building relationships in collaborative research. Winter (1996) argues, in a discussion of key principles for action research, that initiators of action research place themselves and others at risk by expressing and problematising assumptions and processes when conducting action research. This is because action research threatens the status quo of a situation, unsettling standard practices and underlying beliefs. It also challenges the taken-for-granted processes by which academics, as professionals with established reputations for competence, "cope" under conditions in which they lack control and negotiation is required. The risk in these processes became apparent to me as I awaited feedback from the school to the critique and plans I had proposed for the continuation of the project. As I wrote in my journal:

> *I was very relieved when I got an initial positive response on the phone from Ian – the risk to my credibility as a researcher and an academic was at stake! Had I correctly read the messages and meanings coming from the school over the past twelve months? There were risks to personal relationships, too, especially if my comments were taken too negatively (I was mainly concerned for Jo as, after all, environmental education at the school was largely of her shaping). As Winter argues (with considerable insight, I might add!) the "micro-politics" of the research process creates a series of rigorous requirements, where the considerations of ethics (concern for the psychic comfort of our collaborators) mesh with considerations of prudence.*
>
> *Therefore, appreciating the riskiness of the research processes for all concerned is crucial. I certainly felt "edgy" and quite uncomfortable during this period but I believe it also made me more careful and empathetic, especially as relationships are still developing (for example, I spent a lot of time trying to get the wording right in the critique I sent to the school. I wanted to focus on strengths rather than weaknesses, but still wanted to make some points about the existing programs that indicated they could be improved).* (Reflective journal, Cycle 2, 25/2/98)

By the end of this phase, however, the project had been reborn. The changes in the way I interpreted my role in the project and the careful consideration given to the presentation of

[114] This is explored in the literature review in chapter 6.

[115] This raises questions about the efficacy of much of the research and consultation currently being conducted in schools by academics, often working on short timelines. My experience in this project suggests that many projects must, inevitably, be based on false premises and misunderstandings because lengthy investments of time are needed to know and understand contextual factors.

plans and critique strengthened of relationships between myself and the school. As a consequence, the project's purposes became clearer and planning more defined. I was even able to acknowledge that there might be an end to my involvement in the project within a reasonable timeframe.

PHASE 3: CREATING A PROFESSIONAL DEVELOPMENT FRAMEWORK (TERM 2, 1998)

The refocusing of the project was the chief outcome of Phase 2. In the third phase, while the teachers were engaged with the practical activities of the *Earthworm/Stepping Stones Project*, ongoing discussion and planning for the learnscaping project continued. For my part, this was motivated by the lesson learnt in the previous cycle – that we could not allow the project to lose impetus, otherwise it would become difficult to retrieve interest and momentum. However, it became apparent that the implementation of the *Earthworm Project* was causing tensions between staff members. The following excerpt from my researcher's journal highlights how such internal "micro-politics" can impact on planning and project development:

> *I met with Ann and Jo and it was obvious that things were not going too well. Both were feeling pretty "pissed off". It appears that there is rivalry between the Earthworm Project and the Tidy Schools Project. In Jo's view, the two events are in competition instead of working together. Jo feels it is a case of the "tall poppy syndrome", with Ann and Jo perceived to be getting the glory for what is achieved while denying it to others.*
>
> *It was obvious that Ann and Jo were feeling flat, disappointed, hurt and angry about what was happening. Jo reckoned she wasn't going to run Earthworm next year and Ann is taking leave in 2nd term, anyway. Jo indicated that she might take long-service leave next year. So much for "whole school" collaborative planning! especially as I had thought, with EE principles being incorporated into the overall plans of both Earthworm and Tidy Schools, that peace and harmony had broken out!* (Reflective journal, Cycle 2, 20/5/98)

These issues highlighted the importance of paying attention to focus and motivation in the learnscaping project. With this background, I continued to act as the project's mobiliser and facilitator throughout this phase. I did not want the learnscaping project to be derailed once again. Therefore, in consultation with Jo, I assumed responsibility for formatting and detailing the contents of the proposed *Fernwood Learnscaping Manual*[116] and designed a process of professional development that would see it developed largely by the teachers.

I presented a draft outline of this manual in May. This detailed the scope of the manual and identified a range of tasks to be undertaken. I found the process of presenting material for

[116] Later, the title was changed to *Learnscapes Alive.*

discussion to be a useful strategy for generating ideas and actions. It allowed for further reaffirmation of the project's purpose, helped in the allocation of tasks, and aided discussion about ways to broaden teacher involvement in the project. The following entry from my research journal illustrates these points:

> *This visit provided impetus for continued planning for EE in the school. Ann liked the fact that the planning notes were in a folder and the school's name was on it, creating a sense of ownership and reality to all the discussions that had been going on for so long. I was pleased, too, that Jo said there would be sections that the school would write e.g. School Background, School Environment etc. This clearly demonstrated that the program was not being handed over to me (I have this continuing fear that the "expert" is expected to complete the job!). Indeed, Jo reaffirmed that school ownership would be strong in the final product!* (Reflective journal, Cycle 2, 20/5/98)

Building on these comments, I discussed ways to ensure maximum inputs from teachers, so that the program would not end up on a classroom shelf and not used. Hence, my idea of meeting with groups of teachers to help identify key features of the gardens and to develop some concept webs was accepted. (Jo thought she might have done some concept webs when she was at teachers' college – about 20 years ago!). In later discussion, Jo thought we might even be able to organise part of a pupil-free day for this and carry out the activity as a whole school planning exercise. This was a valuable possibility which would reinforce the collaborative nature of the project and also quickly generate a lot of data. It would also provide an opportunity to fully explain my role to staff and what was happening with the learnscaping project. Ann also suggested developing a proforma to provide an easy way to collate teachers' existing, successful outdoor activities so that we could include these in the manual. We also reiterated that the manual should be easy to read and to access – large font, uncluttered pages, activities that are easy to work with, and can be readily supplemented. It was also decided that there should be photographs and children's work as illustrations, as in the Harwood Island Program – overall, a "teacher-friendly program" (Reflective journal, Cycle 2, 27/5/98).

Following these discussions, it was confirmed that we would be able to use part of the next pupil-free day in July as an opportunity for whole school professional development related to the further development of the learnscaping project. I assumed responsibility for developing the details while Jo worked on aspects of the manual itself, particularly the exploration of options for the production of a map of the gardens to help guide the development of teaching and learning activities.

Research Protocols and Processes

In Cycle 1, I described myself as a researcher-facilitator in this study, and in the previous discussion about research protocols and processes I reflected on my changing facilitator role in the project. Issues about my role as researcher-facilitator continued to be important with a multiplicity of roles becoming evident. For example, while my involvement with the development and implementation of the *Earthworm Project* was limited, I was an occasional "sounding board" for this parallel project. The importance of regular visits to the school was also reinforced at this time, as they helped maintain focus on the learnscaping project, even though teachers' time and energy were directed elsewhere. These visits also served to strengthen my personal connections with the teachers, as they demonstrated my interest beyond a narrowly-focused personal research interest. Furthermore, my role as an observer during these visits enabled me to broaden and deepen my understandings of the school's environmental education activities.

In this phase, I shifted the focus of my role from that of an active facilitator to more of a traditional qualitative researcher undertaking the conventional roles of gathering data, observing, recording and interviewing. This arose because the learnscaping project was less significant while the *Earthworm Project* dominated attention. Consequently, I used this time to collect a range of published documents, such as prospectuses and school newsletters, as well as to conduct interviews.

With regard to the interviews, I decided to broaden their focus in this phase. To date, I had concentrated on interviewing the people most involved in environmental education. However, I was also keen to interview those who were not so directly involved, namely parents. This was in order to obtain a broad range of perceptions about environmental education in the school, and because parents' views could be seen as "windows" into students' environmental education experiences. Consequently, I conducted a focus group interview with four parents who, it transpired during the interview, were also executive members of the Parents and Citizens Association. A second interview was conducted with a volunteer parent-helper, who was also a part-time environmental education/science teacher in the school. Both these interviews were straightforward, and able to be conducted without the limited time constraints that usually applied when I interviewed the teachers. In fact, both interviews became quite relaxed and informal "chat" sessions.

I also conducted an email interview (Appendix H) with the storyteller during this phase because we were unable to meet face-to-face due to time constraints. A primary purpose was to investigate his perceptions of how the storytelling process had been implemented in

the previous cycle. I was also keen to record his suggestions for extending upon the environmental stories that were developed in the previous year. The intention was that these ideas would be included into the learnscaping manual so that the stories became an embedded and enduring feature of the learnscaping curriculum, and this was achieved. This email interview was an efficient interview method which had the added advantage of not requiring transcription. Overall, this phase saw progress made in the learnscaping project, as well as a deepening and broadening of my understandings of the research context.

Analysis and Reflection

In this section, I analyse and reflect upon the broad meanings of events, interactions, processes and outcomes of this third phase of Cycle 2. During this phase, a clear outcome for the project was finally identified – the development of a teachers' learnscaping curriculum manual. I developed, and had endorsed, a draft structure for this, as well as a process for developing and writing the document. It was confirmed that a session on the pupil-free day in July would be set aside to meet with teachers, to explain the plans and to commence development of activities for inclusion in the learnscaping manual. However, while I was pleased that action was finally being made in the project, the following commentary from my journal sums up my true feelings about the proposed developments:

> *While I feel we are finally making progress with the learnscaping project, in many ways I am frustrated and underwhelmed by what we are going to produce. I had such high expectations but, in the end, it's really going to be less than I'd anticipated, especially in a school where "green" credentials are well established and where the so-called "expert" is on tap! What I've learned is that change happens in small steps not giant leaps! though I feel this glacial pace is concerning in terms of the scale of global sustainability challenges.*
>
> *Perhaps I shouldn't be too discouraged, though. I think the process is a bit like that of a "pull-back car". It starts slowly, overcomes inertia, rapidly gains momentum and accelerates away fast! I'll just keep telling myself this is only Stage 1, laying foundations, and that there will be lots of subsequent community involvement and an increasing "critical edge" to the school's EE in the future.* (Reflective journal, Cycle 2, 27/5/98)

Despite these reservations, the project moved forward. The interviews with parents and with the storyteller were particularly helpful, as they widened my sources of data, "tested" my own perceptions against those of others, and helped me gain new ideas and perspectives. Overall, they added rigour to my developing interpretations and analyses. Key ideas emanating from these interviews follow.

Parent Views

I interviewed parents to ascertain the extent of their understandings of the goals of the school's environmental education activities and their levels of interest and support. The

parents interviewed were highly enthusiastic about the environmental focus of the school, and endorsed a survey conducted in late 1997 (School survey responses, Cycle 2, 25/2/98) which ranked environmental education as one of the top three strengths of the school, marginally behind the multi-age organisation, and slightly ahead of teacher quality. As the following excerpt from the transcript shows, these parents particularly valued the whole school nature of environmental education and appreciated the continuity and modelling across the school in relation of environmental matters:

> **Parent 1:** *Whole school activities are really important, even though classes do different things. At lunchtime, even the little ones get in and help clean the gardens…. They are all fighting over the garbage bins to see who can clean up... even the little Grade 1s and 2s. They are all into the environment, keeping it clean, keeping the school nice and it's just by watching what the older ones are doing.*
>
> **Parent 2:** *The kids are not forced into having to learn about (the environment). It just comes natural to them …It's not like real school....They do real school work everyday but they don't think they are. They don't understand that sweeping paths and looking after plants and stuff is schoolwork. It's all fun…I look at my children and I know that they are getting good learning and they are not lagging behind…*
>
> **Parent 2:** *From the time my little one was kneehigh to a grasshopper, she wanted to go up to Jo to do the compost and the tadpoles and the birds. The kids come during the holidays too. They work a roster system to look after the birds during the holidays and swap the keys around, taking responsibility, which is good. It's a 12-month thing, not just a school time thing. It's not a 9 to 5 job that you do just 40 weeks a year.* (Transcript, Cycle 2, 11/3/98)

Another aspect of environmental education that parents valued was that they were also learning how to value the environment through the school's environmental activities. The following responses illustrate this:

> **Parent 3:** *With recycling, I notice the kids say "Mum, that doesn't go in that bin!"*
>
> **Parent 4:** *And we are constantly worrying whether the new things the P & C is doing within the school will fit in with the environment, like the new after-school building. The question of whether it would fit in was first on our list. I had a huge involvement in the new landscaping and we spent a huge amount of money. I mean, I am up here on the weekends, picking up litter…making sure everything is all right!* (Transcript, Cycle 2, 11/3/98)

These parents also recognised the lasting impacts of the environmental education programs and projects that the school engaged in, as these comments reveal:

> **Parent 2:** *I think the kids notice more now. When we go on holidays my kids are horrified to see garbage on the beach and my older one got involved in the "Clean Up Australia Campaign" this year, which he has never wanted to do before.*

Parent 1: *We were at Hastings Point and there were these little lizards that were different from all the other lizards we get here, and the kids spend all weekend crawling on their hands and knees, sussing these things out.*

Parent 2: *And Sara is in Year Nine this year now and when we come back here with Luke, she says "Oh, This is my tree! And it's going so well".*

Parent 1: *I have a girl in Year Twelve now and every time we come up here we have to go up to see how her trees are going.*

Parent 2: *I think the kids looking after the environment here takes these ideas out into the wider environment, too. When they are older hopefully they will instil in their children to continue the process and maybe they can do something positive eventually, too. It's probably too late for our generation, but the next one coming though...* (Transcript 2, Cycle 2, 11/3/98)

Overall, this group of parents felt that the environmental education activities were very worthwhile and were helping to embed pro-environmental attitudes, values and actions in their children.

However, one parent and a part-time teacher (Ali) who had a background in environmental education,[117] while generally positive about the school's programs, was more critical and analytical. First, she reflected that the science curriculum was limited to "experiments" and not related to the school's environment much at all. Science, she saw, was an opportunity for integrating environmental education into the mainstream curriculum that was not adequately taken up. She also questioned the value of the *Earthworm Project* as the school's main commitment to environmental education. She commented that, once a project was finished for the year, environmental education was essentially "off the agenda" for the large majority of teachers. She continued:

Ali: *The facilities here are very under-utilised, I think, because the teachers don't really know what environmental education is….They are capable of doing it, but they are not doing it because they don't really know what to do. They need some basic lesson plans and ideas.*

They do activities using the environment but it's not environmental ed. They are not teaching the kids to see what is there, and to appreciate what is there, and to find problems, and to work out ways of fixing them up. Except well, in the upper school with Jo, it's being done….Overall, the kids are looking for more. (Transcript 1, Cycle 2, 11/3/98)

Later in the interview, Ali continued her critique of environmental education at the school:

Julie: *In a way do you think things are just kicking off here? Maybe there is a reputation that's bigger than reality?*

[117] Ali's partner is principal of an environmental education centre.

> **Ali:** *No! I think the kids are taught to respect the environment but there is a lot more that can be done to get a real environmental education program going. Earthworm is great! And I think it forces a lot of teachers to do something whereas maybe it wouldn't get done otherwise. That might be being a bit harsh, but that is the way I see it.* (Transcript 1, Cycle 2, 11/3/98)

However, Ali remained positive about the value of the environmental education at the school in relation to other schools she knew:

> **Ali:** *As a family, we have been to two other primary schools and this school is way ahead environmentally of all the others. Environmental education is non-existent in most schools, or the ones I've seen.*
>
> **Julie:** *Even so, you are aware of the limitations…*
>
> **Ali:** *Yeah, but we do something here and that's a step up the ladder.* (Transcript 1, Cycle 2, 11/3/98)

Ali's views were similar to mine in that she felt that many of the activities and projects lacked a critical orientation and continuity. She also supported my perception that the teachers lacked professional development in environmental education. I was gratified that here was an "insider" who endorsed my conclusions about the school's environmental education programs.

Storyteller's View

My impressions of the school's environmental education programs were further extended through the email interview with the storyteller. From his viewpoint, a positive aspect was that the activities were conceived as being for all students in the school – not just for "special" groups such as those in "Gifted and Talented" programs.

> **Storyteller:** *Working with the whole school is great. It develops an energy that is missing with smaller projects. Having an interesting environment right outside the classroom is a bonus, too. When I do projects in boring schools (which is most of them) I have to get the students thinking about environments further afield and their ability to do this is usually not very well developed. At Fernwood, students go outside and check on details. Koalas really do climb down out of the trees during lunch time!* (Email interview response, Cycle 2, 17/5/98)

He also endorsed the practice of creating stories about the students themselves and their own local setting because this affirmed the students' relationships with the environment. He explained this further:

> **Storyteller:** *This is validating and empowering, giving them ownership and many chances to explore their environment from different angles. Students have a lot more energy for stories about themselves and their friends.* (Email interview response, Cycle 2, 17/5/98)

In relation to the process that had been implemented at the school, the storyteller commented that he would have liked to have had more time with the teachers before and after the storytelling project. In particular, he felt that this would have encouraged greater teacher involvement– and therefore greater student participation – in planning the story "hand-over" ceremony thereby making this much more, exciting, fun and dramatic. Overall, however, he expressed satisfaction with the way the storytelling project evolved and offered numerous ideas for further developments.[118]

In summary, these interviews added to the growing data about the school's environmental education activities, helped validate my own assessments of current practices, and provided me with ideas and possibilities for the next phase in this action research project. However, these interviews also confirmed that professional development in environmental education needed to be included as a crucial part of the planning for the development of the school's learnscaping curriculum.

PHASE 4: STAFF WORKSHOP 1 (JULY 1998)

This phase was the first period of whole school action in this learnscaping project, and was concerned with the development and implementation of the first stage of a professional development program for the school's teachers. During my university mid-year break, I negotiated a format for a workshop to be held on the pupil-free day in July and hoped that Jo would be co-presenter. This workshop was planned to include an introduction to, and overview of, environmental education and education for sustainability, and to show the linkages between the learnscaping project and these educational approaches. As I wrote by way of explanation in an email to Jo:

> *Have been working from the "big issues", like the potential collapse of the human race, and connecting these to the importance of loving the lizards and worms at Fernwood!*
> (Email from Julie, Cycle 2, 26/6/98)

During this time, I prepared a series of mini-essays (Appendix K illustrates the topics that were developed) to preface the learnscaping manual and to serve as its rationale. These also became the basis of teacher handouts and my working notes for the professional development workshop (Cycle 2, 14/8/98, workshop materials). This preparation also included the development of templates to assist the teachers in recording existing outdoor

[118]These included publishing the stories and making plays, videos, murals and websites from their content. For the stories to become "springboards for action", he also suggested a "Rainbow Lorikeet Flying Squad" to engage in environmental actions in the school and local community.

teaching and learning ideas and activities, as starting points for further curriculum developments. Rather than presume that entirely new materials were needed, the intention was to build on teachers' current teaching practices. As I commented in my journal:

> *This is also a way for teachers to have inputs into the development of the learnscaping manual and, hopefully, have a greater investment in and ownership of the project.* (Reflective journal, Cycle 2, 10/6/98)

Eventually, Jo declined to co-present the workshop saying she was uncomfortable in such a public speaking role, so I became the key presenter. In order to accommodate other professional development sessions programmed for the same day, the initial section of the learnscaping workshop – the introduction and rationale – was delivered twice, with the staff splitting into two groups. There were five topics featured in these introductory sessions:

- an overview of environmental issues and concerns;
- the role and importance of education for sustainability and environmental education;
- the value of learnscaping in the curriculum;
- the presentation of the *Earth Carers' Code* for the school (Appendix M);[119]
- the integration of environmental education into key learning areas.

Each of these introductory sessions generated good discussion about environmental issues, particularly as many of the topics and issues raised were those that had emerged in discussions with Jo and others over the previous eighteen months. Therefore, I knew that the content corresponded with the teachers' needs and queries. The principal also attended the first session and reaffirmed the school's commitment to environmental education, which reinforced to the teachers the value and importance of the learnscaping project.

The second part of the workshop involved the teachers working outside in the gardens in small self-selected groups. The goal for this session was to generate learnscaping activities across a range of content areas, using the templates designed for this purpose. In hindsight, these documents were too structured for this stage of the process and were abandoned in favour of simple concept webs. Overall, the workshop was very well received, and provided impetus for the next phase of curriculum development that involved the writing of

[119] This is a "code of behaviour" that outlined preferred student (and adult) behaviours in relation to the school's gardens.

cross-curricula activities for each of the learnscaped gardens. A tangible measure of the success of the workshop was that the principal offered additional class-free time to enable small groups of teachers to work together, in school time, on the follow-up tasks. Funding for this came through reallocation of the school's discretionary professional development monies.

Research Protocols and Processes

In this section I again discuss the changing nature of my role in this action research project with my role shifting from initiator, mobiliser and negotiator to that of "inspirer" (Jensen et al., 1996) and "orchestrator" (Lincoln, 1997). In many ways, I was very comfortable in these roles, perhaps more so than in the earlier roles. After all, conducting professional development workshops has been relatively standard practice for me and, here I was working with material in which I had great interest and up-to-date knowledge. As inspirer, I developed and presented material to engage the teachers with sustainability issues and to assist them to appreciate the potential of their educative roles as part of a transition to sustainability. As orchestrator, I designed, and set in progress, a democratic process that encouraged the teachers to become the main developers of the learnscaping curriculum. This was a process that supported teacher ownership, collaboration and cooperation in the development of the learnscaping curriculum, aimed at finally overcoming the notion of myself as the only expert in environmental education in the school.

Overall, this was a period of great satisfaction. This was because the investments of time, energy and effort that had been spent on the "invisibles" of the research – relationships-building, learning about the school context, negotiating the nature of the project – were rewarded through meeting the teachers' needs and generating their interest in the project. I attribute these successes, specifically, to the iterative processes of research, planning and reflection. I had continuing dialogue with Jo, especially via email, where we discussed plans, made modifications and negotiated content. This meant that we were able to generate outcomes that were based on knowledge of the setting itself, and were validated by reference to a broad body of relevant research literature.

Analysis and Reflection

In this section I provide a general analysis of, and reflection upon, the events, processes and outcomes of the fourth phase of Cycle 2. This was a very productive phase with some obvious actions and tangible outcomes, and it seemed that the project might finally have an end point in the not-too-distant future. While the developments underway might not have represented the "ideal" of critical environmental education, my research into environmental

education literature indicated that very few exemplars of critical environmental education exist in practice. Rather, there is a plethora of papers that discuss "theoretical" notions of critical environmental education and how it might be achieved, but few actual studies that discuss its enactment. I suggest that this indicates just how difficult this is to achieve in practice.

The curriculum development process that was designed in this phase had several positive attributes. Clearly, the process was building upon the school's own needs and experiences in environmental education; it was giving value to teachers' current practices; it was extending teachers' knowledge in relation to environmental education; and it was seeking to affirm and support the teachers as curriculum developers. These were significant achievements, especially at a time when this school, like all others, were undergoing a raft of educational and administrative pressures and changes,[120] some of which could be construed as antithetical to the purposes of environmental education.[121]

Overall, I felt that progress was finally being made on the project and that the principles of inclusivity and "ownership" of the project were becoming a reality. This was despite a potential setback occurring just prior to the workshop that was encapsulated in the following query from Jo:

> *Have heard about a woman who will come to the school and write an entire program for a couple of thousand dollars…Very tempting. What do you think? Is the task beyond us yet? Or do we march on regardless?* (Email from Jo, cycle 2, 20/6/98)

I was quite shocked by these comments. I thought we had made some real progress with the project and that we shared the value of involving a wide group of teachers as curriculum writers, instead of using just a consultant-expert. My response was as follows:

> *While progress is rather slow, I feel we are moving forward and I am hoping that the inservice with teachers on 6 July will generate ideas/ activities/ enthusiasm from within the staff. In the end I feel this is important in terms of getting staff engaged with the program. They need ownership (just like the children need to "own" the gardens) otherwise the program WILL sit on the shelf, and not be implemented, or will be implemented half-heartedly. There is loads of research that indicates that top-down models of professional development and curriculum change usually fail because teachers do not have a sense of being part of the changes, or of seeing relevance to their own work. This would be my major concern in relation to getting someone in from outside – it might be quicker but will it have a long-term effect?* (Email from Julie, Cycle 2, 23/6/98)

[120] Two new syllabuses were being introduced across the system, an innovative "trial" curriculum framework was being proposed; schools were being asked to choose between different models of self-management; issues of assessment, benchmarking and common testing were being debated.

[121] Issues of "managerialist" and "rational" approaches to educational reform are discussed in the literature review in chapter 6.

In her response, Jo apologised for being “down”, and commented that she had other “issues” at the school that were affecting her energy and enthusiasm for the learnscaping project. She concluded with the following message:

> *I agree the school’s EE should be developed by all concerned, or at least started by all, but it’s just seemingly such as enormous task.* (Email from Jo, Cycle 2, 26/6/98)

While I was relieved that this gave endorsement to the process that was currently being developed, these comments gave me cause to ponder the project from Jo’s perspective as a classroom teacher, rather than from my own as an academic researcher. I recalled what Stoeker (1997) had written about the roles and skills of the academic action researcher. He commented that it is often only the academic researcher who has the time and energy to put into a research project, as community members generally have more important or pressing things to do. I, for example, was already on an inter-semester break of about five weeks, and I was engaged in stimulating and creative preparatory work for the workshop. By contrast, Jo was still teaching her class, and dealing with the day-to-day tasks, upsets, and challenges of being a classroom teacher. She was also demoralised by continued infighting in the school and concerned that I was “doing all the work”. Overall, she described herself as “a very educationally disillusioned puppy” (Email from Jo, Cycle 2, 23/6/98).

I could relate to these feelings of disillusionment, as I had experienced them myself. Jo needed reassurance that we were making progress with the project, and that I was content to continue with workshop preparation and the drafting of the rationale for the manual. I reiterated that I expected the workshop to provide an impetus for the project’s continued development. I also suggested that a remedy for Jo’s disillusionment was greater involvement in the planning and delivery of the workshop. However, she declined commenting that she was uncomfortable with public speaking. This was a surprise as I had thought that Jo would have been a keen speaker, cajoler and “stirrer” in quite public ways, in her role as initiator and motivator of the school’s environmental activities over the years. This new knowledge proved to me, again, just how important it is to work for extended periods in a school and to have regular contact, in order to continue learning about the research context. Overall, this phase was one of deep learning. Not only was I finding out about how to implement school-based environmental education (through reading, writing and preparing materials for the workshop) but I was deepening my understandings of the personal and procedural processes of conducting action research in a school.

The preparation for the workshop session also expanded my understandings about environmental education concepts and approaches, and how these are perceived by

teachers. In the rationale presented to the teachers, for example, I presented some "facts and figures" about global social and environmental challenges as a way of drawing attention to the gravity of these matters. As I wrote in my journal:

> *I decided to include this "big picture" stuff as I feel that understanding the scale of environmental challenges now and ahead is a good starting point so teachers can see the value and purpose of doing EE at school. This kind of overview has been successful with university students in helping them understand the imperative for EE, so I expected this approach would also work for the staff here. For most, I believe this was the first time that this kind of material had ever been presented to them.* (Reflective journal, Cycle 2, 7/7/98)

This first part of the workshop presentation generated a range of discussion topics. These included the potential for technological solutions to get us "out of trouble" ("green" technologies at Hong Kong airport were cited as an example); the massive scale of the problems and how impotent people feel in the face of these; and that environmental education needs to be a responsibility for all, not just for busy and overworked teachers. These discussions provided opportunities for me to highlight the potential of local actions in the school, such as the learnscaping project, as ways for developing "capacity" in children, teachers and the broader community to address environmental issues, and to see the power of education in this process. The response by the teachers to the discussion was thoughtful and positive.

The second part of the workshop related specifically to the school's environmental education activities. I had the opportunity to address a range of perceptions and attitudes towards environmental education that had emerged from the "local" data I had been gathering and analysing since the start of this study, as this journal entry shows:

> *This session enabled me to address issues that had arisen in discussions with Jo, and from my own research, over the past 18 months. I wanted to convince the teachers that EE was a valid part of the school curricula. Jo had mentioned that some teachers thought that EE/Earthworm should only occur every couple of years, implying their lack of appreciation of its value – a "fringe" activity! While I believe it to be intrinsically important, it is also now part of the new Studies of Society and Environment (SOSE) key learning area and, therefore, somewhat mandated. This "insider knowledge" into teachers' thinking about EE ensured that I could address these points specifically in the workshop. This reinforced the value of researching in a setting for lengthy periods, and in "action research" mode. There is no way I could have known what teachers thought had I not had regular and meaningful conversations with Jo over an extended period.* (Reflective journal, Cycle 2, 7/7/98)

The third part of the workshop was designed to "practice what I preach" – that environmental education, especially for children, should incorporate significant amounts of active, integrated outdoor learning. Hence, we worked outdoors in the gardens. I also wanted to validate the teachers as environmental curriculum experts, especially as the first

parts of the workshop would have reinforced my role as the academic "expert". As I wrote in my journal about this session:

> *I wanted to get inputs from the teachers so that they would become significant contributors, so that it became their program, not mine. I wanted to validate for them that their knowledge of the school and their experience as teachers was crucial to the curriculum being developed. Therefore, I acknowledged that they already had an extensive range of activities and creative ideas that could be used. I really wanted to dispel the idea that this was to be a specialist-driven process. I wanted to reinforce for the teachers that they are experts, too, and that I am simply helping with the development of a process, not running the show.* (Reflective journal, Cycle 2, 7/798)

It was during this "outdoors" part of the workshop that I was able to have lengthy personal interactions with some of the teachers. Normally, my visits centred on discussions with Jo and, to a lesser extent, with Ann and Ian. I knew most of the teachers only on "nodding" terms. In this session, however, I was able to have longer conversations, put "faces to names", and to find out more directly about teachers' concerns and needs. An example related to the issue of weeds, illustrated this. A teacher commented that he would like to look after the care gardens with the students and help them to become "environmental stewards". However, he was unsure about weed identification and was afraid that the students would pull out plants of value. This revealed just how much environmental educators take for granted. Grandiose plans for student empowerment can be stymied because a teacher does not know the difference between a weed and a native creeper!

In summary, I sought two main outcomes for this workshop. One was to promote positive attitudes towards environmental education. The other was to elicit practical integrated teaching and learning ideas, activities and strategies from the teachers. Some excellent ideas were suggested, particularly a "Maths Trail" for the Shape and Texture gardens, and an "enchanted forest" concept for English-related activities for the amphitheatre located in the Koala Corridor. Altogether, I felt the workshop achieved these outcomes. Ian also affirmed the success of the workshop, both verbally at the time and in a formal letter of appreciation (Appendix L) in which he wrote:

> *The presentation provided an excellent background to environmental education in schools and also stimulated others to take on greater responsibility in this program.* (Letter from principal, Cycle 2, 14/7/98)

Another sign of success was that, when Jo suggested to Ian and the staff that teachers be granted additional "release time" from classroom teaching to further develop the curriculum ideas that had been initiated during the workshop, this was approved. Hence, it was decided

that the next pupil-free day, five weeks later in August, would also be dedicated to furthering the learnscaping curriculum writing processes.

PHASE 5: STAFF WORKSHOP 2 (AUGUST 1998)

This section outlines the main events, interactions and outcomes of Phase 5 of the second cycle of this action research. Observations and reflections from the July professional development workshop gave new data that was used to design the second workshop. One of Jo's tasks was to organise the teachers into collaborative writing groups, formed loosely around the subject areas that had developed during the first workshop. As she negotiated these groups, she was also able to gauge teachers' interest for the project, as revealed in this journal entry:

> *Jo followed up with the teachers and received strong support for their continued involvement. She commented that those who had been the strongest "non-believers" became the most "switched on" during the first workshop, and appeared the most enthusiastic to continue. We speculated that perhaps we had found an effective way, through adopting a cross-curricula approach to curriculum development, that enabled the teachers to see how their particular curriculum interests (Language, Maths, the Arts etc.) could be catered for in environmental education. Perhaps the science orientation of the past had excluded them.* (Reflective journal, Cycle 2, 22/7/98)

My role during this period was to sort through and consolidate the ideas generated by the teachers in the first workshop. This involved looking for links between activities, curriculum content and the gardens. I also had the task of developing a strategy for the completion of the project which included a time line for completing the writing of the learnscaping program, and final editing and publishing.

Prior to the second workshop, I visited the school to discuss and validate the plans for the workshop, the project time lines and the strategy for completing the final document. Jo suggested that we should aim for the first draft of the teachers' curriculum plans to be completed by the end of Term 3. Even though I thought this was unrealistic, as it allowed only about five weeks, Jo thought this was feasible and this became our target date. Consequently, we also opted for a short time frame for the completion of the first draft of the entire learnscaping manual, this being in mid-December, at the end of Term 4. This document was to include the rationale for the project and principles of environmental education (already underway); revised and edited sub-sections that the teachers were to complete; as well as new sections, such as resources lists and information sheets, yet to be compiled. Our goal was to have a comprehensive and "good-looking" draft document for the teachers to use for teaching and learning purposes for the start of the 1999 school year.

It was our intention that, after a trial period, the document would be further revised, and then published in its final form at some later date when funds became available.

I commenced planning the second workshop. For the first workshop, I had dedicated two weeks to preparations because it had fallen during the mid-year break between semesters. This time, however, I was in the middle of a very busy period of university teaching. In the previous year, the impact of this pressure had made progress on the project rather slow and disjointed. This time, in spite of the pressures, momentum just *had* to be maintained. Fortunately, the research undertaken for the first workshop, and used in writing the rationale for the manual, had given me an extensive range of resources and ideas with which to develop the second session. Consequently, I focused on developing the participatory writing process to be implemented in the workshop that would enable the teachers to work together in self-selected groups on curriculum content of their own choosing. Such a self-development approach to professional development had been advocated in numerous readings[122] about educational change and the professional development of teachers, and I was keen to try this out in practice.

During this time I also prepared guidelines and notes to assist the teachers in their curriculum writing endeavours, drawing on ideas and resources about environmental education explored in the literature review of chapter 4. I sought to emphasise the importance of providing activities that were interesting and exciting for children; that promoted active learning; that encouraged social and shared learning; that developed sensitivity to the outdoors; and that included opportunities for inquiry and action. In retrospect, I wished that I had emphasised these features more fully on the day of the workshop, for reasons that will be explained later in this chapter in my analysis of the outcomes of this cycle.

This workshop lasted for approximately one and a half hours. It comprised a 25 minute overview of ideas collated after the first workshop, a presentation of guidelines for the group writing phase, and a discussion of the time lines for completion of the project. Upon reflection, I realised that I had attempted to cover far too much material in this short overview, and was unable to adequately present the suggested criteria to guide the development of their environmental education activities. I reflected on this in my journal:

> *The first part could have been more focused. I tried to cover too many "big ideas", but this is hard **not** to do as opportunities to influence what teachers think, in terms of EE, are so*

[122] This literature is reviewed in chapter 6.

> *few. Indeed, this meeting was probably the last real opportunity for this. However, I should have been a little more realistic and presented clearer guidelines! A symptom of the rushed conditions in which I prepared this workshop, I feel.* (Reflective journal, Cycle 2, 19/8/98)

Jo and Ian helped to refocus on the teacher tasks for the session and to clarify the intended outcomes. These were that the project would develop, as a first stage, a small number of learnscaping sub-programs, which would be added to once these "got off the ground". These included the development of a Maths Trail, an Outdoor Arts Program, a Colour and Senses Trail, a program for English that included the "Enchanted Forest" concept, while Jo would develop activities related to the Growing Garden.

I expected some discussion about this selection, as not all ideas from the first workshop were included. However, Jo's discussions with the teachers had already confirmed the topics and groupings. Therefore, in the next part of the workshop, each group worked on further brainstorming and development of activities. We met together again as a whole group, sharing what was proposed. We then discussed the proposed time lines. To my surprise, the staff quite happily accepted the challenge of completing all tasks within the given time frame. My journal reflects this surprise:

> *I thought the timelines would freak everyone out, but it was not so. Jo told me that this staff was very "task-oriented" and also that Ian regularly "added value" to their work by offering class-free time to complete such tasks. It was explained that, while the school was technically entitled to another full-time teacher, Ian had chosen to use the salary to provide release time for the teachers in a range of curriculum development projects. This is a real reinvestment in the professional development of staff at this school!* (Reflective journal, Cycle 2, 19/8/98)

The next part of the workshop had teachers again working in the gardens in their self-selected curriculum writing groups, to further develop their learnscaping ideas. Finally, there was a short "sharing time" which revealed an impressive array of concepts, activities and cross-curricula strategies. These included a self-guided walk and brochure in Japanese and other Asian languages proposed by the LOTE teacher; while the Physical Education teacher suggested the compilation of a list of resources and programs in outdoor education and environmental education that are offered outside the school to augment the school-based learnscaping curriculum. The teachers again demonstrated a high level of interest and engagement with the task, as I later recorded in my journal:

> *One of the teachers working in the English group said, "This is great. I've surprised myself!" The LOTE teacher, in her "report back", commented, "This is exciting. I want to do this!", and, when we went back indoors, Jo commented "Great session! People are really excited and enthused by this!"* (Reflective journal, Cycle 2, 19/8/98)

Research Protocols and Processes

In this section, aspects of the research process that had relevance in this phase are discussed and critiqued. Overall, it was the power of action research, as a change creating process, that made the strongest impression. I witnessed how my investigations into topics such as curriculum integration, environmental education, and learnscaping, as well as democratic models of professional development, directly influenced teacher thinking. In their small groups, the teachers developed interesting ideas and practical teaching and learning strategies for making educational use of the learnscaped areas of the school. This was a direct result of what had been distilled from the literature about these topics and then presented to the teachers, in the two workshops. Theory and practice were being drawn together, and in collaborative ways, as the teachers interacted with each other, and as they interacted with me, as researcher.

Another importance feature of the research processes that was apparent in this phase related to participation and collaboration. These were principles of action research that I had been keen to develop since the inception of the study. However, I have already noted that they were problematic, causing the action research of this study to be reconceptualised and renamed as facilitated action research, rather than participatory action research. However, in this phase, project participation shifted significantly from being "owned" and directed primarily by Jo and me, to a process that gave ownership to the classroom teachers. This was a liberating experience. It demonstrated that the early difficulties in seeking to mobilise teacher interest and to build relationships with the teachers had finally had benefits. Not only did a large part of the workload shift from Jo and me, but the teachers' participation meant that the project would also benefit from the wide professional knowledge of the teachers and from their enthusiasm for the curriculum writing tasks.

Analysis and Reflection

I learned an important lesson from this phase. This was that the development of environmental awareness and action through education is an evolutionary process, not a revolutionary one, an idea discussed further in the literature review of the next chapter. For example, it had taken eighteen months for the project to finally develop to the stage where there was wide participation, interest and significant momentum in the process such that I could now anticipate an endpoint. I was beginning to think that this moment would never be reached. I wrote in my research journal after the second workshop:

> *Last year I was worried that I was viewed as the "expert" who was expected to be the key writer of the learnscaping program. I have worked strenuously for this to be a school-wide curriculum project and believe this has been achieved, somewhat. It raises some interesting*

issues about environmental education in schools though. If other environmental educators take a look at this program they will surely be critical of it for not being "critical" enough. However, there is a contradiction here in that there is also a belief in the principle that environmental education should promote democratic and inclusive processes and develop from "local" needs and interests. This school wanted a program, right from the start, that (in this order of priority):

1. *had children and teachers using the outdoors as a classroom for the teaching of the KLAs;*[123] *and then*

2. *encouraged teaching and learning outdoors within a framework of "environmental stewardship".*

If I had succeeded in deflecting them from this order of priorities (and, unwittingly, I did try!) the project would no longer have been what the school wanted. Currently, the school is moving towards achieving ***their*** *stated primary goal. I wonder how much support there would have been for a more critical agenda or how successful its implementation would have been, had I pushed harder for these. I've tried to push the boundaries, sure, and have had some success. What I understand now, though, is that this project marks just a "first step" along a continuum towards critical environmental education. There are some features of critical environmental education in this current project, though, as it is locally focused, collaboratively developed and "school owned". However, these attributes will be largely invisible to future reviewers of the program.* (Reflective journal, Cycle, 19/8/98)

Overall, my experiences in the development of this project confirm that innovation that requires significantly different ways of thinking and working, that is, that requires a cultural change, is bound to take a long time to develop. This is especially so when teachers have had little or no preservice or inservice professional development in the area of the intended change. Understanding of the need for the change, new cognitive frameworks, as well as practical teaching and learning strategies, have to be developed together.

Supporting this evolution is the new *Studies of Society and Environmen*t syllabus released in 2001. For the first time in Queensland schools, environmental education is a mandated part of the school curriculum. Some schools, like Fernwood have already found a place for environmental education. The release of the new syllabus, however, has legitimised its place. It can be expected that new and diverse ways of incorporating environmental education principles and practices into day-to-day teaching will develop across the state especially as familiarity with the syllabus grows, and professional development expands. Fernwood has already made progressive developments to its schoolgrounds and to its environmental education curriculum over a number of years. Current activities are just part of this continuing process. I anticipate that environmental education at Fernwood will continue to evolve, in further small steps, well into the future.

[123] There are eight compulsory Key Learning Areas (KLAs) that structure Queensland school curriculum for Years 1-10. These are Science, Health and Physical Education (HPE), Studies of Society and Environment (SOSE); The Arts, Technology, Mathematics, English, and Languages other than English (LOTE).

PHASE 6: TEACHER CURRICULUM WRITING CONTINUES (TERM 4, 1998)

The final phase of this cycle was concerned with completion of the teachers' collaborative curriculum writing activities, and the compilation of all other materials into the first draft of the learnscaping manual. Jo liaised with the principal for a third set of "release time" for each of the teacher groups to complete these tasks. Consequently, in the final two weeks of Term 3, each group had the equivalent of a full school day to again work together. Term 4 was to see the final presentation of the teachers' work. During this phase, some trialling of the plans, along with final editing and printing of the manual, was also anticipated. Jo outlined how these final preparations were proceeding in an email:

> *Have had various groups working on EE stuff this week and things seem to be going fine. Haven't actually seen anything yet, but people have requested extra time, so they must be doing something. I'm working as a committee of one, as no one else seems to want to do any of the science-type things…Oh well, at least we'll have people out in the grounds doing something with children, even if it isn't science…we hope!* (Email from Jo, Cycle 2, 2/9/98)

This part of the project did not require my direct inputs. Therefore, I refrained from involving myself in these teacher tasks, leaving this to Jo. However, experience over the past two years had taught me not to become too removed from "the action" and that I needed to remain involved in the project to help maintain momentum. It was agreed that I would continue reworking the rationale of the learnscaping manual and, after the teachers' work was completed and collated, would act as editor, providing some commentary and critique. During this time I also interviewed two of the collaborative teacher groups (Transcripts, Cycle 2, 8/9/98 and 11/11/98) in order to triangulate my data and to further deepen understandings about the project. I also re-interviewed Jo and Ian in separate face-to-face interviews during this period (Transcripts, Cycle 2, 4/12/98 and 8/12/98). Jo, for her part, took responsibility for the numerous other tasks needed to finalise the project. These included word processing the teachers' work onto computer disk; seeking copyright clearance for pre-published materials; completing a map of the gardens to guide activities; and exploring funding options for publishing.

We both felt that the project was finally nearing completion. As Jo wrote in an email:

> *Have had some great progress with the EE program. Still a long way to go, but I can actually imagine something getting done…The English group has finished. I have typed it all up and they are currently reviewing it to see if it all makes sense. They have been very formal in their ideas but have many garden links. Whatever…I think it's great. My class has also started a collection of herbarium cards that will hopefully help with plant ID for everyone. The kids had a lot of fun doing these. One of those things you are sure the kids will find a chore… and they end up wanting to do more!!* (Email from Jo, Cycle 2, 22/9/98)

During this time, too, there were other environmental events underway, in addition to this work on the learnscaping manual. In October, for example, Jo and Ann visited Harwood Island School in northern New South Wales. This was the school that wrote *Hands-on Learnscaping* which had provided the model for the way the Fernwood learnscaping manual was structured. However, this visit proved to be a big disappointment because the grounds had fallen into disrepair and there was little evidence of teachers and students using the outdoors for learning. As Jo emailed upon return:

> *It was very sad. Since Helen (the principal) has left, the whole project has fallen apart…. The project is now "in maintenance" phase…whatever that means! We took a few photos and left …basically with our tails between our legs for being so silly and wanting to see what was going on. We were definitely an intrusion.* (Email from Jo, Cycle 2, 18/10/00)

This experience reinforced for me just how difficult it is to create and sustain environmental education in a school. The Harwood Island Learnscaping Project had been considered an exemplar of environmental education and learnscaping,[124] and now, it appeared that, it too, could not be sustained, even with the apparent support of its local community and institutional support from the New South Wales Department of School Education. This was indeed disappointing news, and made me rather less optimistic with regard to this current learnscaping project.

Research Protocols and Processes

In this sixth phase, issues related to my role as a facilitator continued. The use of email provided a useful way of maintaining interactions and relationships and information on the progress of the project. However, I also made some visits to the school because my experiences in the first cycle showed that it was important to continue to have a face-to-face presence in order to maintain momentum in the project. The following journal entry illustrates this:

> *There wasn't really a compelling reason to go down to the school, however, it is important to be a "presence" to help keep focus on the project and to continue to build relationships. Jo confirmed this when she commented that my regular visits "keep us on track". She said she thinks to herself, "Oh, Julie's coming; I'd better get something done, even if it's just a little bit to move things forward". Actually, the same goes for me too. The visits provide motivation and timelines to work to, in terms of planning for the project or for getting on with data collection, such as conducting interviews. At this stage in the process, I find I am doing both on these visits – moving the project along and moving the data collection and analysis along simultaneously. It hasn't always been as well balanced.*

[124] In 1999, the project originator won the prestigious Banksia Environmental Award, a national award offered by the Banksia Environmental Foundation to honour members of the community who make a significant contribution to environmental improvement.

> *In retrospect, I think that had I made more visits in the latter part of 1997, the project may not have hit the wall. My thinking at the time was "Nothing much is happening, therefore, no need to visit". Now I think "Nothing much is happening. I'd better have a visit!" Of course, all kinds of things are happening in the project, so the visits keep me informed, provide insights and keep me "in touch" with people.* (Reflective journal, Cycle 2, 28/10/98)

Also in this phase, interviewing and data verification became important features of the research process. The first of two focus group interviews conducted in this phase was with the four teachers preparing integrated activities linking the English syllabus with the gardens. The interview, organised through Jo, was conducted in the staffroom at the end of their writing session, at a time when they were already together and willing to talk about their work. This was not an ideal space for an interview as teachers, parents and others were moving into and out of the room, however, it had the advantage of minimising interruption to the teachers' work. The interview lasted about thirty minutes, was tape recorded with the teachers' permission, and later transcribed. I used an open-ended set of questions to guide discussion and to help keep the "conversation" on track, especially as time was of a premium. However, several supplementary questions emerged, eliciting additional and important insights. Following the interviews, no interest was shown by the teachers in viewing transcript or my interpretations of their comments. Therefore, to satisfy my own desire for authenticated data, I relied on later conversations to clarify or validate comments. As I discussed in chapter 3, the use of conversation as a research technique (Feldman, 1999) helps the process of sharing and clarifying knowledge, grows understanding, and offers some level of member-checking and data validation.

The second focus group interview was with the three teachers who had developed the Maths Trail. A similar format was followed as for the previous group interview; however this was far from being an ideal interview. For a start, it was very rushed, only twenty minutes, as it was held during a lunch break. Also the background noise from children's play and teachers in the adjoining staffroom made it difficult to separate the voices. This made transcription a difficult task. In addition, the time between the teachers completing their writing task and the conduct of the interview was about eight weeks, as this group had finished quickly and had not needed additional planning time. I wrote in my journal after this interview session:

> *This was not a particularly revealing interview. I suspect because the gap between the curriculum writing and the interview was too long. The teachers were reflecting on their practice rather than "living it", as the previous group had done. The reality is, however, that I couldn't have done the interview much earlier as there was time for only one group interview before the September holidays. Afterwards, we were all too busy.* (Interview notes, Cycle 2, 11/11/98)

I resolved to conduct interviews with Jo and Ian before the end of the school year while the project still had immediacy, as a result of this experience. The first of these interviews was with Jo. It lasted about 35 minutes and was held during a class-free period so that we could have a reasonable length of time for the interview. Again the issue of data validation arose. I highlighted this in my journal:

> *Jo commented that she never wants to see the transcripts and notes because they make her sound like "an incomprehensible idiot". She gave me permission to change her words around 'so that she'd sound intelligent!" She asked whether I had written anything up from any of the journals and data I was gathering. I commented that the only thing was the PhD confirmation document but that I would like to show material to her when it was written, to see that I was making interpretations that were fair. Jo commented that she liked reading and would be happy to do that. I'm pleased, as this is another level of validity/ cross-checking/collaboration for this research process.*[125] (Interview notes, Cycle 2, 2/12/98)

The second interview of the day was with Ian, the principal. While the interview provided useful data related to the project, the most powerful comments came after the tape recorder was turned off. These post-interview comments helped me to understand, more fully, the tensions and opportunities created by the school micro-politics. I reflected upon these remarks in my journal upon my return home so as not to lose the invaluable insights that they offered. For ethical reasons, however, I have not used these comments in this report.

Analysis and Reflection

This phase was expected to culminate in the publication of the learnscaping manual which would mark the completion of this project. This was a time of high-energy inputs, mainly coordinated by Jo, and involved a large number of teachers, working in groups, completing their respective integrated curriculum tasks. I focused on redrafting the rationale and gathering interview data to assist in the completion of this thesis.

These interviews provided opportunities to add to my understandings about curriculum change and ways of organising professional development. The focus group interview with the "English" group affirmed that the two workshops I had designed and implemented helped create commitment to the learnscaping project and used processes that encouraged and supported them in their writing. This was revealed in the following interview excerpt:

> **Lyn:** *It was easier than I thought it was going to be, I've got to say.*
>
> **Julie:** *Because it has been a group process?*
>
> **Lyn:** *Yes. To do it on your own would be… You know when you first spoke to us about the whole global issue of environmental problems, I commented, then, that it was*

[125] At the time of submission, Jo had read the entire manuscript, offering some minor edits and occasion comments. Overall, she has endorsed what I have written.

just so overwhelming. That was exactly how I felt when we came to write this program…like, you know, where do you start? But I think the way you and Jo organised the breakdown, it hasn't been as mammoth as I had first anticipated.

Toni: *Yes, it's good.* (Transcript, Cycle 2, 8/9/98)

These teachers also commented that they were surprised at the range and quality of ideas that they had generated. They attributed this to being able to choose their workgroups and their curriculum content area, which led to high levels of motivation. The teachers also took pleasure at the "valuing" of their efforts, as demonstrated by the class-free time they had been granted to work together on their tasks. As the transcript revealed:

Julie: *What has been good about the way you have been working together? What have been the support mechanisms have helped you to do that?*

Glenda: *Chocolates! and bribes!*

Lyn: *I think one of the great advantages has been having time to do it, because we're not begrudgingly coming here. Like if it's an after-school thing, you know, "I should be doing this, this, this and if I'm paying a babysitter to look after my child, I really don't need to be doing this".*

In the big picture of my life, this isn't really an important issue. I've found that I have been able to put so much more into this project because we have been given this precious time, and we know it is precious, so we want to make sure the results are worth it.

Liz: *It gives it more credibility, doesn't it, if it's looked upon as something that is so important that you are released to do it, and the whole thing has been coordinated so we can work together.*

Lyn: *And it is not a rush job, either! It's not like "We've got to get out of here! That'll do." So that's been good. It is just fun, too. You never get a chance, ever, to sit and have a chat about planning or anything, really. You are so busy rushing here, there and everywhere…*(Transcript, Cycle 2, 8/9/98)

For the Maths group, also, a significant contribution to satisfaction with their writing task was the freedom to self-organise. Early in the process, this group allocated tasks and made a decision on a common format for the presentation of their activities. This involved the development of student activity cards for independent and small group work in Maths using the outdoor learning areas. These teachers worked quickly and well in their chosen way of planning, and even had time to trial many of the activities with their classes. Consequently, they became more and more enthusiastic as they proceeded with the writing task, and also increasingly more supportive of the benefits of teaching and learning outdoors as they trialled their own ideas. This is shown in this interview excerpt:

Gayl*: It gets the children into the gardens and to use the gardens for a purpose rather than just looking at them, but using them carefully, respecting them.*

Fiona*: I think it makes them really aware of the plants, too. You're looking for symmetry or alternate leaves or whatever. They're looking more closely at the environment they have around them, rather than looking at a picture in a book, or a book on nature – it's real life.*

Gayl: *There's more enthusiasm, too, more communication. My kids are saying "Do you think that is perpendicular? And the other one says, "Oh, yeah, I think it is" and sometimes they'll find a way to test it. They'll put the corner of their book on the seat or whatever to see if it's perpendicular, helping each other out. They'll ask somebody else what they think.* (Transcript Cycle 2, 11/11/98)

Jo supported these comments, noting that there had been a perceptible shift in the way this group of teachers' were now working with students. She commented during interview:

Jo: *Do you want an example of teacher ownership? Gayl's the best. She would not take her class anywhere outside the door before, but she got involved. She made up some other people's Maths activities, and changed a few, and whatever. She thought she'd trial them and see if they worked. She's been out all over the place doing them and the kids have loved it, and consequently she has been encouraged to go and do more. The activities that she has compiled are already being used. And she owns that little part of the learnscaping program. She probably won't ever look at the whole thing, but she knows that in that book there are those pages that are good. Maybe you might get her looking at some of the other stuff… and then perhaps she might own the whole thing upon completion!* (Transcript Cycle 2, 4/12/98)

Thus, there was a significant shift in the "ownership" of the project during this phase. Jo and I were no longer running the project once a large number of teachers were brought into the planning process. The principal recognised the importance of this, too, making the following comment during one of my visits:

Ian: *Ownership by the teachers is a big plus!* (Interview notes, Cycle 2, 11/11/98)

Thus, completing the project by the end of the school year was going to be an achievable goal, it seemed, especially with the high levels of interest, participation and ownership being demonstrated by the staff.

Another factor that was identified by the teachers as contributing to the success of these curriculum developments and professional development processes was the democratic leadership style of the principal and his support for the processes. All groups and individuals interviewed affirmed that Ian was an effective leader who motivated, supported and encouraged the teachers to be innovators and leaders too. Comments made by Jo during her interview summed this up:

Jo: *Ian is good with the "warm fuzzies" and is not egotistical…. He's not one of these people who says "Oh yes, **my** staff did this, and **I** have done that!" It's "so and so*

> *manages all this. She is the one to see." It feels good…. He gives credit where credit is due and he doesn't constantly check on how you are going. He lets you run. And if you've proved you can do something…he lets you go a long way before he calls you in and says "That's enough! You've spent enough money!" or "This has to finish!" No, he gives you a fairly big lead to play with, and hang yourself on, once you have earned it.*
>
> *That's his role, I think, to stay out of the way, but to be there….You know that if you do it well, he won't have any problem saying so, and he won't have any problem acknowledging to the whole community who did the work…. He won't want any share of the recognition. And that's nice. And then we trust him, too, because we know that if we do a good job, he is not going to turn around, and then we hear later, that he went to a principal's conference and told everyone what* ***he*** *was doing. Which we have all had done to us!* (Transcript, Cycle 2, 4/12/98)

The teachers were highly supportive of Ian and valued the support that he gave them in return. As Jo summarised, "People would go over cut glass for Ian" (Transcript, Cycle 2, 4/12/98). However, tensions and stresses also operate alongside such positive dynamics. Therefore, a final lesson that I learned during this phase was that interpersonal relationships – not only institutional, or educational and pedagogical factors – also play a significant part in creating or mediating the conditions for curriculum and school innovation and change.

LITERATURE REVIEW: ENVIRONMENTAL EDUCATION REVISITED

The literature review undertaken in this cycle concerned deepening, rather than broadening, my understandings of topics and issues explored in the first cycle. In particular, three areas of literature, related to the implementation of environmental education, were examined. The first involved an investigation of integrated curriculum. The second was an exploration of whole school approaches to environmental education, while the third examined teacher constraints in the implementation of environmental education. The first two are important aspects of the holistic approach to education advocated for critical environmental education. Both reviews contributed significantly to how I developed the workshops that were conducted during this cycle, and to the draft rationale that was prepared for the learnscaping manual. The third review helped me to understand some of my dissatisfaction with the outcomes of the project. All three areas of review assisted in the framing of my analyses and interpretations of data that occurred during this cycle. Following is the review of these three topics, expanding upon the introductory review of environmental education that was presented in chapter 4.

EXPLORING INTEGRATED CURRICULUM

The importance of integrated curriculum to environmental education was identified in the literature review about critical environmental education in Cycle 1. This discussion also included some of the common ways that teachers seek to achieve curriculum integration,

that is, through using themes or topics; by means of projects, clubs, competitions and awards; and integrating around problems or issues. However, it became apparent as this study progressed that integrated curriculum is a concept rarely examined in depth in (environmental) educational literature. Perhaps this implies that it is an uncomplicated, straightforward concept, not warranting much explanation or discussion. Early in this project, however, I perceived that teachers' conceptions of integrated curriculum were somewhat superficial, which lead me to conduct a more detailed review of this concept, centred upon a monograph by Drake (1993) which became a seminal reading in this study.

Drake identifies three ways of structuring integrated curriculum – a multidisciplinary approach that focuses on separate disciplines tackling the same theme; an interdisciplinary approach, which explores the generics that can be found across the curriculum; and a transdisciplinary approach, where discipline boundaries are transcended altogether. Drake argues that at the heart of these different approaches are serious epistemological questions and that "the conceptual framework for each position seems to be fundamentally different" (p. 34). An examination of each of these approaches follows.

Multidisciplinary Approach

Drake comments that this approach is often the starting approach adopted by teachers wishing to develop integrated curriculum as it allows them the comfort of working in the discipline bases with which they are familiar. She provides an example of this approach in action, using exploration of "cars" as a theme. Ideas are clustered for further investigation into sub-themes, such as pollution, design or transportation with concept mapping and semantic webbing[126] being useful tools for helping to discover the natural and obvious connections. Overall, a multidisciplinary approach breaks down a few boundaries amongst subject areas but leaves the disciplines intact enough to allow teachers to continue to organise knowledge through discipline structures. Drake suggests that the overarching question that this approach asks about learning is *What is important to learn within different disciplines?* Drake levels criticism at this kind of theme-based integrated approach, however, because the resulting curriculum is often superficial and can limit people to what they already know. These comments support those made by Hamston and Murdoch (1996) in the earlier review of curriculum integration, outlined in chapter 4.

[126] These strategies provide a graphic display of words, ideas, and images in concert with textual words, ideas, and images. They help activate background knowledge, organize new concepts, and discover relationships between two or more bodies of information.

Interdisciplinary Approach

Interdisciplinary approaches to curriculum integration shift the emphasis from themes or topics, to subject areas. In this approach, the focus moves to commonalities across disciplines, emphasising common processes such as metacognition and learning how to learn (Drake, 1993). Hence, it is often the metacognitive, critical thinking skills that provide the organising principle for order and structure, with the content and procedures of individual disciplines transcended. This is because, for example, decision-making and problem solving involve the same principles regardless of discipline. The question about learning and teaching here, says Drake, is *How can we teach a student higher order competencies?* The curriculum planning wheel is a useful teaching tool for this approach as it extends the limits of semantic webbing. Drake provides a practical way of enacting this approach, giving the exploration of the issue of "cities and car dependence" as the example. Here, students apply generic research and problem solving skills across a range of disciplines to come to a possible resolution.

Transdisciplinary Approach

The third, and most powerfully transformative, integrated approach that Drake discusses, is the transdisciplinary approach. When this approach is adopted, there are so many interconnections that they seem endless, with themes, strategies and skills merging, especially when the context for learning is set in real-life. In this approach, disciplines are transcended, but their concepts embedded within the connections. The main pedagogical question with a transdisciplinary approach, according to Drake, is *How can we teach students to be productive citizens in the future?* This approach involves skills such as change management, dealing with ambiguity, perseverance and confidence. Content is not considered intrinsically important and is determined by student interests and issues, with the emphasis on meaning and relevance where knowledge is explored as it is embedded in a real-life context.

In this approach, the transdisciplinary web, or "real-world" web, is a useful integrating device. Drake compares this to using a kaleidoscope, where looking through one lens presents the viewer with a certain pattern, but shifting to another lens makes the same pieces exist in another pattern. She suggests that the best approach is to focus on the connections, and to value this as a life skill. In creating such a web, comments Drake, most users discover that everything interconnects. What emerges, then, forces brainstorming beyond the dictates of the disciplines; boundaries completely dissolve, and connections are

vast and apparent. Drake remarks that this webbing strategy also emphasises the values embedded within the web, and hence, demonstrates that knowledge is value-laden.

Overall, in a transdisciplinary approach, says Drake, "focus is shifted to core learnings that are essentials, essential to living one's life in the future" (p. 43). These learnings should be very broad and few in number and should be set in a context of personal relevance so that students become involved in curriculum planning. As Brady (1989) in Drake (1993) suggests, there are possibly five major categories for these core learnings that can help students make sense of human experience. These are: environment, humans, ways of acting, ways of thinking, and how these are interconnected.[127] Rather than teaching chemistry or history or mathematics, or focusing on the teaching of higher-order thinking skills,[128] education should, instead, focus on what is essential for survival, where life skills are paramount. However, Drake comments that alongside the development of transdisciplinary approaches to curriculum, there also needs to be a transformative vision for education. This is because, from her experience as an educational consultant, "the nature of the process of integration is such that most [teaching] teams glimpsed transdisciplinary interconnections, but were often frightened at this stage and retreated to a position with more structure" (p. 40).

Drake identifies the transdisciplinary approach to integrated curriculum as the most powerful and transformative approach. Nevertheless, she proposes that each of the three has its place, preferring to see these more like "Chinese boxes nested in one another" (p. 48), than as separate or alternative approaches. Hence, there are parallels between these three approaches and the three ways of viewing education, *in*, *about* and *for* the environment, where each contributes to a greater whole. There are other parallels between these different domains of educational practice. They both have common foci on learning that is futures-oriented and change-oriented; that provides real meaning for students; and that encourages exploration of complex issues. The conclusion to be drawn from paralleling transdisciplinary approaches to curriculum integration and education *for* the environment is that critical environmental education demands the transdisciplinary form of curriculum integration, rather than either of the forms that maintain subject boundaries.

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[127] In 2000, a curriculum development project called *New Basics* began trialling a set of "rich tasks" in some Queensland state schools. These tasks are based on the interdisciplinary areas of: life pathways and social futures; multiliteracies, numeracies and communications media; active citizenship; and environments and technologies. These ideas match, somewhat, the "essential learnings" advocated by Drake and Brady. For further information, see www.education.qld.gov.au/corporate/framework/.

[128] These need to be included, but should not be taught at the expense of learning how to live in a complex world, says Drake.

EXPLORING WHOLE SCHOOL ENVIRONMENTAL EDUCATION

The second area of literature that impacted significantly on my thinking and actions in Cycle 2 concerned "whole school" approaches to environmental education, considered a desirable attribute of holistic environmental education. Further exploration of this seemingly straightforward notion, however, provided new insights into the complexities and challenges of implementing environmental education at the whole school level. The fact that issues of curriculum integration are intricately bound up in issues of whole school implementation, compounds the challenge (Nixon et al., 1999).

The Whole School Ideal

The implementation of environmental education in "whole of school" ways in order to maximise benefits and minimise fragmentation, is advocated by numerous authors (Gough, 1992; Murdoch, 1992; Palmer & Neal, 1994; Randle, 1991), as mentioned in earlier discussion on this topic. Additionally, Greig, Pike, and Selby (1989), Hart (1997) and Thomson (1996) also support whole school approaches, in particular, where both "horizontal" dimensions across subjects, and "vertical" dimensions integrated into buildings, school environment, waste and energy components, are practiced (Gough, 1992). Generally speaking, all these authors suggest that the fundamentals of environmental education are more likely to be embedded into the educational and organisational structures of a school if promoted at the whole school level, than if enacted through isolated and piecemeal activities that are often aligned to specific subjects or groups.

There are a number of newly emerging whole school frameworks that seek to synthesise curriculum and management practices in schools. These include the United Kingdom-based *Eco School* movement[129] and the United States-based *Green Schools* movement.[130] In Australia, the *Sustainable School*[131] is a concept gaining interest and attention as a whole school framework for embedding environmental education and principles of sustainability into the everyday educational, operational and financial strategies of a school. There is also the *Schools for a Sustainable Future*[132] strategy, based in Victorian, Australia, which aims to support and promote schools working towards sustainability. At an international level, *Health Promoting Schools*, a whole school strategy that has emerged from the public health

[129] See http://www.eco-school.org.uk
[130] See http://www.ase.org/greenschools
[131] At the time of writing there is little in print or on the web about this concept. Interest has been generated mainly through a number of "Sustainable School" forums.
[132] See http://www.sfsf.com.au.

sector,[133] is an approach that seeks to link health, environment and education. The belief is that these kinds of whole school approaches reinforce, in numerous and repeating ways, what is valued as important for students to know. This knowledge is then made central to what is taught and learnt through all aspects of a school's curriculum, organisation and internal and external relationships.

Whole School Realities

Nevertheless, despite the perceived benefits of whole school approaches, Nixon, Sankey, Furey and Simmons (1999) maintain that those who support whole school programs and processes, frequently find that strong "boundary maintenance" (p. 305) prevents or limits success. The reality is that whole school developments in environmental education, and other cross-curricular formulations such as citizenship, multiculturalism or social equity, are rarely the case. Nixon et al. identify a number of reasons why this might be so.

Their argument centres on the rigidities of "knowledge classification" as having a significant negative influence of teachers' attempts at curriculum innovation and change, and the failure of whole school environmental education as lying in its lack of a designated curriculum base. The paradox, these authors comment, is that a specific content area gives legitimacy to a subject area, but that subject "specialism" severely limits teachers' capacities to work holistically. The impact of this, argues Posch (1994), is that, without designated staff and specific content, environmental education is pushed towards the margins of school activities and into the leisure time of students and teachers. This issue is compounded, say Nixon et al., because subject areas are now so closely defined as a result of central government reform, that there is very little room for innovation within, and creative linkage across, the curriculum.

Another barrier to whole school approaches is the demand on teachers for increased accountability, which has seriously impacted on teachers' capacities for cross-curricular experimentation and innovation. Nixon et al. (1999) suggest that professional development and advancement, for example, are seen, predominantly, in terms of particular, preferred subject specialisations. These are often associated with literacy, mathematics, science and technology rather than, say, the social sciences, arts or environmental education. Because of these hierarchical curriculum rankings, teachers tend to narrow their focus towards the higher ranking subject areas. The consequence is that environmental education maintains its

[133] This movement, supported by the World Health Organisation, views school curriculum as comprising three broad but interlinking components - curriculum, teaching and learning; school organisation, ethos and environment; and school-community partnerships. See http://www.sofweb.vic.edu.au/hps.

place at the margins of school curriculum. In a system with predominantly subject-based curriculum which is also hierarchically ordered, therefore, this way of organising exerts a powerful influence on teachers' sense of professional identity and, also, on how schools are managed. As a consequence, these authors suggest that any influence that environmental education and other cross-curricula formulations might achieve must be gained by "extending laterally across the curriculum and by colonising the curriculum margins" (p. 308). This is because subject specialisation is too strongly embedded to place these alternatives towards the centre. Thus, to be effective, these "border crossings" need to be seen as both inward, that is creating cross-disciplinary activities and projects, and also outward, with schools become more involved with their local communities.

Nixon et al. (1999), Posch (1994) and others recognise that creating a place for cross-curricula environmental education means a major restructuring and reorganisation of schools. Despite this challenge, however, successful environmental education that has lead to transformation of "normal" teaching so that it becomes part of all teaching,[134] have developed. However, what really matters, say both Nixon et al. (1999) and Posch (1994), is that schools change "as a whole," and that the teachers of the many discipline areas must work together to an understanding of how best to achieve such change.

In most schools, however, the reality is that environmental education is an extra-curricula project resting on the shoulders of a few committed teachers. As Elliott (1988) cited in Posch (1994, p. 26) comments, these are often teachers with strong personalities "who do not feel the urge to be loved by everyone". Walker (1995, p. 125) comments that these teachers often have considerable power over what happens in environmental education in their school, such that:

> Unilateral control involves masterminding situations, whether from benevolent or malevolent intent, by taking control over goals, over how to involve others, over how to gather and interpret relevant information, and over how to manage people's feelings.

The "wear and tear" on these committed teachers should not be understated, however, as this kind of holistic curriculum work requires a lot of time, energy and stamina. Furthermore, being "not normal" continuously risks being marginalised by normality. Indeed, many teachers who participate in environmental education activities, Posch (1994) suggests, are "sitting on the fence" at the periphery of the school system. He continues:

[134] Two examples are outlined in the case studies of Staritski (1996) and Thomson (1996).

> Communication between centre and periphery is conflict-prone because it jeopardises the stability of the centre, and thus the functioning of the whole system. On the one hand, a certain destabilisation is the prerequisite for the incorporation of new developments. On the other hand, a certain vigilance and scepticism are crucial for the survival of the centre, since not each and every peripheral activity is apt to promote the evolution of the system (p. 26).

Faced with such difficulties and tensions in implementing cross-curricular environmental education, Nixon et al. (1999) conclude that whole school change is usually more rhetorical than actual, mainly sporadic, fairly marginal to the mainstream curriculum, and rather diffuse in its approach. As a consequence, the adoption of environmental education is invariably an incremental change within fixed parameters, rather than sweeping structural change. Furthermore, what structural change there is tends to be piecemeal, that is, "resourceful and innovative, certainly, but severely constrained and lacking any overarching managerial purpose" (p. 312). As a consequence, conclude Nixon et al. (1999), whole school change is likely to be conceived as modest modifications to existing structures, rather than acting as a catalyst for significant educational change.

EXPLORING TEACHER CONSTRAINTS IN ENVIRONMENTAL EDUCATION

Walker (1995), too, has explored the issue of environmental education implementation in schools and shows concurrence with the findings of Nixon et al. (1999) about the shallowness of its uptake, and also with Posch about problems associated with implementation of environmental education when only small numbers of committed teachers are involved. However, she extends this discussion, based on her research in Australian primary schools, and identifies additional practitioner constraints that act as barriers to the implementation of holistic, integrated (and critical) environmental education. Walker's research, which focused broadly on the settings in which teachers practice, examined a wide range of factors such as organisational structures, physical settings, and practitioner's beliefs and values as factors that constrain curriculum integration. In general, these show a link between subject specialisation and teachers' educational theories. The conclusion Walker was able to draw was that solutions to solving practitioner's problems about environmental education need to examine, not only issues of formal curriculum, but also the dimensions of practice, policy and teacher education.

In terms of curriculum issues, Walker's research supports the conclusions of Nixon et al. (1999) that integrated, interdisciplinary and even separate-subject approaches to environmental education, present difficulties for teachers, and have been mainly unsuccessful. While "crowded curriculum" arguments have been promulgated by teachers as reasons why this is so, Walker suggests that the main cause of failure lies more with

incoherence of theories – and consequently epistemologies and pedagogies – between interdisciplinary studies, such as environmental education, and the "theory sets" of subject disciplines. She states:

> Practitioners are left with the dilemma of revising their theory sets in each of the subject disciplines or revising their theory set of environmental education so that it coheres with the theory sets of the subject disciplines and practitioners' theories of teaching and learning. (p.126)

Walker continues that it is usually the latter that occurs, which does little to engender quality environmental education. However, it is not only the theory sets between traditional, subject-based models of curriculum and more "progressive", integrated approaches that lack coherence. Curriculum incoherence also exists between environmental education and a range of non-subject oriented curriculum approaches that also vie for recognition, such as that formulated on Gardner's concept of "multiple intelligences". Indeed, it seems that opportunities for theory confusion exist in several ways, militating against effective practitioner participation in environmental education.

In relation to the practice of teaching, Walker suggests that significant issues for teachers are confidence and control in curriculum decision-making. These issues are demonstrated through teachers' lack of confidence about their knowledge of environmental education, their abilities to influence how it is enacted, or how to question and change conditions in their school. She found, too, that teachers' theories of teaching and learning and their theories of environmental education were also often incoherent. The nett effect of all these constraints, suggests Walker, is that teachers have little engagement in environmental education, or give up control to those individuals who seem more committed and knowledgeable.

The third dimension identified by Walker as a constraint on practitioners, relates to environmental education policy and implementation. She comments that even though environmental education is mandatory in all state schools in New South Wales, for example, evidence shows that it is not widely implemented. Walker contends that effective policy needs to be accompanied by implementation strategies. These need to support practitioners with professional development, resources, school-based policies, and assessment and reporting procedures which help teachers convince groups, such as parents and unions, that environmental education is worthwhile and in the student's best interests. Clark and Harrison (1999) endorse these comments, adding that additional support in the

form of *national* policies that commit to environmental education are also needed to support and encourage teachers to implement environmental education.[135]

Finally, Walker considers the dimension of teacher education as a constraint on environmental education implementation. In particular, she remarks, much more exploration of theories of environmental education in the context of general theories of teaching and learning is needed in teacher education. She suggests that both practicing teachers and prospective teachers need opportunities to identify agreements and disagreements between competing educational theories, and to identify the most coherent alternative theories that will result in a solution to the problem of environmental education implementation.

Hart (1996) has also looked at alternative ways to help teachers theorise about environmental education, as his research with teachers in Canadian primary schools indicates. Indeed, this research has determined that rationalised, inductive theories of curriculum are not at all helpful in assisting teachers to implement environmental education. Instead, he found that what drives teachers to "do" environmental education is a deep sense of fundamental values about what is right to teach children, with such teachers having somehow acquired "the ethic" that makes it imperative that they involve children in environmental education (Hart, 2000). What is needed in teacher education, he suggests, is greater "practical philosophy" that maintains conditions for personal and social critique, for continuous personal growth and change, and which encourages teachers to become reflexively self-aware. At a broad level, this parallels Walker's call for greater use of problem-based approaches, which incorporate action research, to be included in teacher education. Through such approaches, the problematising of teachers' own philosophical and theoretical standpoints might be encouraged, and the development of theory coherence and practical philosophies might be supported.

CONCLUDING COMMENTS ABOUT IMPLEMENTING ENVIRONMENTAL EDUCATION

The literature examined for this review fostered a deepening of understanding and greater awareness of the links between curriculum integration, whole school environmental education and teacher constraints in the implementation of environmental education. Hence, an appreciation of ways to implement integrated curriculum so that it accords with education *for* the environment was developed. The problematic nature of teacher theory

[135] In 2001, the Commonwealth Department of Environment and Heritage released a national action plan However, this has no mandatory influence over the curriculum decisions of either individual teachers or the various schooling systems operating across Australia.

making about environmental education, especially within the dominant curriculum framework of subject specialisation, was also explored in depth. This helped to further my understandings of why whole school approaches to environmental education are so difficult to develop and sustain. Finally, the inadequacies of most teacher preparation and teacher development programs in helping teachers recognise and problematise incoherent theories about education, and to build deep values about the fundamental meanings and purposes for education were highlighted. The impact of this review of literature was such that it led to a professional development component being incorporated into this learnscaping curriculum project in order to address some of these issues. Overall, this literature review provided impetus and opportunities to shape and refine the actions in the field.

OVERVIEW OF THE SECOND CYCLE

The first section of this chapter detailed the six phases of Cycle 2 of this learnscaping curriculum project. As in the previous chapter, this included a narrative report of significant events, a summary of key strategies and protocols related to data creation and collection, and a synthesis of emergent issues arising from the analyses, interpretations and reflections that occurred during each of the six phases. The second part of the chapter was a review and synthesis of three areas of literature – integrated curriculum, whole school implementation of environmental education, and teacher constraints in the implementation of environmental education – that helped shape my thinking and actions during this cycle.

In this third section, I present an analysis of Cycle 2. This is organised as follows: description and critique of curriculum outcomes; discussion of the processes of change; discussion of new and continuing themes that have further developed my "living theory" about facilitating educational change and action research; and the articulation of research questions from Cycle 2 that guided learning and actions in Cycle 3. In summary, this second cycle saw the incorporation of some "critical" education components into the 1998 *Earthworm Project* that helped expand teachers' ideas about environmental education and encouraged integrated outdoor learning. These early changes were then strengthened through the professional development workshops of July and August that led to the writing of the learnscaping manual. It is this document, the tangible outcome of this cycle, and the processes that lead to its development, that is described and critiqued below.

DESCRIPTION AND CRITIQUE OF CURRICULUM OUTCOMES OF CYCLE 2

This first draft of the learnscaping manual has two components (Draft learnscaping curriculum, Cycle 2, 28/10/98). The first is a rationale, derived from my knowledge and

research into environmental education and was tailored to need the needs and interests of this particular school context. Initial reviews of this material were positive. Jo commented that the document provided a clear explanation as to why teachers should engage with environmental education and that staff from Open Access[136] had "Oohed and aahed all over [your] stuff" (Email from Jo, Cycle 3, 27/3/01). The principal also commented "Great background from Julie" (Email from Jo, Cycle 3, 8/7/01).

The second component is a set of teaching and learning ideas for cross-curricular outdoor activities in the garden areas of the school. These were developed by the teachers after the two professional development workshops and are summarised as follows:

Colour and Scent Garden: This set of activities promotes an appreciation of, and empathy for, the natural environment. There is a strong focus on sensory experiences, aesthetic development and encouragement of environmental sensitivity.

Shape Garden: Mathematics is the focus for this garden. Activities include measurement, patterning and symmetry, mapping and grids and have been organised as "task cards" for independent student use.

Line and Texture Garden: This garden facilitates learning in the Visual Arts. Activities include drawing, clay modelling and weaving, and have been selected mainly from the art curriculum text, *Running on Rainbows*, that is used extensively in Queensland schools.

Koala Corridor: Issues and topics in Science and Studies of Society and Environment are explored through the activities developed for this area. Topics include the study of the koala and its habitat, and opportunities for exploring human-environment interactions.

Rainforest Garden and Habitat Garden: Learning in these gardens focuses on habitat studies in the *Life and Living* strand of Science, and human-environment interactions associated with the Studies of Society and Environment key learning area. There are also activities related to the English curriculum, including genre studies in poetry, stories, reports and letter writing.

Aboriginal Food/Use Garden: This garden provides a vehicle for Indigenous studies and perspectives, a key component of the Studies of Society and Environment key learning area. Activities also include teaching and learning in Science and Technology, and Indigenous cultural practices in art, music, dance and storytelling.

[136] This is Education Queensland's publishing house, who reviewed the manual in late 2000, for possible web publication. To date, this has not proceeded.

***Growing Garden (Shadehouse*)**: Activities developed for this area focus on plant propagation and the study of plant life cycles. These are directly related to the *Life and Living* strand of the Science syllabus, but can also be linked to learning areas such as mathematics and literacy.

Positive Attributes

Compared to the learning outcomes developed during the *1997 Earthworm Project*, the 1998 learnscaping curriculum outcomes showed a strengthening and deepening of the processes begun in 1997. In particular, education *in* the environment increased dramatically in 1998, revealing a growing awareness on the part of the teachers of the value of outdoor teaching and learning. There was also the inclusion of some activities that could be constituted as education *about* the environment, such as studies of plant life cycles. Some activities could be constituted as education *for* the environment, such as those focused on issues concerned with koala habitat protection. Overall, the 1998 learnscaping curriculum developments demonstrate an evolving knowledge and practice of environmental education by the teachers in the school.

Taken collectively, the teaching and learning activities developed in Cycle 2 displayed the following characteristics:

- They provided numerous opportunities for students to "explore outdoors" and to learn *in* the school's local environment. Teachers have quite deliberately prepared materials that utilised the outdoor areas and gardens of the school.

- The teaching and learning ideas contained a few suggestions for issues investigation and environmental action, especially in relation to koala habitat protection. Overall, some critical components were incorporated into the manual.

- The values of stewardship, ownership and collective responsibility were further embedded into teaching and learning activities, especially through the application of the "care" garden concept.

- The gardens became a major integrating device with significant attempts made to incorporate cross-curricular or integrated teaching and learning activities.

- Many more teachers were involved in the project in 1998 compared with 1997, with almost all teachers becoming curriculum writers. The participative workshops

helped support teacher ownership of, and commitment to, the development of the learnscaping manual, and reinforced collaboration and teamwork.

The Limitations

Nevertheless, the curriculum activities developed during this cycle are also open to critique. Taken as a whole, the outcomes of the 1998 learnscaping curriculum project demonstrated only a marginally greater critical focus than that demonstrated in the previous year's project. Curriculum change is a slow and incremental process, it seems. Overall, analysis of the outcomes revealed that:

- There continued to be a strong "green" science orientation, with many of the activities being about plant and animal habitats and "growing things". Alternative ways of viewing the environment were not really apparent.

- While the gardens served as a device for integrating the curriculum, the resultant activities were relatively superficial. Curriculum integration was of the "multidisciplinary" type, in terms of Drake's discussion, where subject barriers remained mostly intact.

- Winning environmental competitions and awards continued to be an important motivation for engaging in environmental activity, although a stronger emphasis on embedding environmental values was perceived.

- While there was a growing awareness of the importance of exploring environmental issues and of including action-oriented learning approaches, such approaches were not extensively incorporated into the activities written for the manual.

LESSONS LEARNED ABOUT THE PROCESSES OF CHANGE

The section above provided a description and critique of the curriculum outcomes developed in the second cycle of this action research. When compared with the materials generated in the previous year, these new materials showed some modest development of attributes considered indicative of critical environmental education. For example, there were more activities for outdoor learning; cross-curricula integration was developed further; and there was some evidence of a beginning critical orientation. However, problematical aspects were also evident. The following complexities and issues associated with the processes of change were revealed (i) maintenance and development of relationships of trust (ii) curriculum change through professional development (iii) support

and ownership through participation (iv) issues with conflicting curriculum frameworks and (v) project leadership issues. Each of these issues is now examined.

Maintenance and Development of Relationships of Trust

Complex personal and micro-political relationships exist between teachers and an academic researcher, between school administrators and teaching staff and between teachers themselves. I had not anticipated how much time and energy would be needed for building and maintaining these relationships. Overall, a high proportion of my time and energy was expended in seeking to understand and develop working relationships, on easing tensions, and trying to advance planning and actions within, and beyond, the constraints of these relationships. Usually, these required face-to-face interactions. Even though email became a useful communications tool, it did not preclude regular, face-to-face contacts.

Curriculum Change through Professional Development

The first cycle revealed the busy and fragmented nature of the work of the classroom teacher. My experiences in trying to organise group meetings to collect data, or to discuss project planning, showed what few opportunities there are, within teachers' busy daily schedules, for collective discussion about curriculum matters. Consequently, it became increasingly apparent that professional development was necessary in order to create shared understandings about the learnscaping project, and the role of environmental education within the school's overall curriculum framework. This idea was supported by the principal who gave value to the project by sponsoring two "whole of staff" workshops and a number of small group writing sessions as professional development for the teachers. These were not extra-curricular activities added to the teacher's daily schedules, but were incorporated into regular routines, with additional funding allocated to cover teachers' classroom duties while they worked on the project. I believe that such support and commitment for environmental education is the exception rather than the rule in most schools.

Support and Ownership through Participation

As indicated above, the experience of this project suggests that teacher professional development is vital for curriculum development in environmental education. It also suggests that the model of professional development utilised should be one that supports teachers' professional interests and enhances teacher collaboration. This is particularly so in recognition of teachers' fragmented work lives and because so few opportunities exist for them to engage in cooperative curriculum activities. Accordingly, a professional development approach was adopted that gave the teachers opportunities to develop a shared understanding of the project; to choose the colleagues with whom they would work; and to

select the content area for which they would develop ideas and activities. Overall, offering flexibility was a successful strategy as it motivated and energised the teachers, as the following journal entry (Reflective journal, Cycle 2, 7/7/98) indicates:

> *These group sessions provided the "energy" that had been missing from the project. They have helped create a "shared understanding" for staff that hopefully will be the catalyst for increasing teachers' involvement. The seeds of this were apparent, with informal conversation overheard (in the toilet!) of two teachers planning to get together informally to work on creating an outdoor "Maths Trail".*

Other teachers expressed similar enthusiasm for the project. After the second workshop, a teacher was overheard commenting to her self-selected group:

> *This is exciting! I want to do this!* (Reflective journal, Cycle 2, 19/8/98)

Conflicting Curriculum Frameworks

The workshops and interviews conducted in the latter part of this second cycle revealed that there was generally a superficial understanding of environmental education and ways to implement integrated curriculum approaches. Prolonged participation, observation and conversations with staff also revealed the fragmented nature of the theoretical models and frameworks that teachers used to construct their teaching approaches. As a result, there appears to be a lack of curriculum cohesion, leading to a confusing and sometimes contradictory blend of teaching and learning strategies. Experience suggests that teachers are offered a smorgasbord of curriculum approaches and teaching and learning strategies during the course of their careers, however, there is little evidence of critical perspectives having much influence on thinking and practice.

Although some endeavours were made to address issues of critical pedagogy through the professional development program, time was short and there was much to cover. Furthermore, the issue of curriculum coherence was not even recognised as being of consequence until after the sessions were concluded, when later reading and reflection raised my awareness of its significance. By then, however, any opportunity for dealing with such a complex issue had passed. Moreover, I believe this is an issue requiring much more sustained professional development than this learnscaping project could offer. Challenging, and then changing, superficial and fragmented views of curriculum require significant and prolonged professional development for teachers, perhaps best coordinated and resourced at the systemic level, to complement school-based initiatives.

Project Leadership Issues

The final issue to be highlighted in this second cycle concerned matters of project leadership. Frustration at the lack of progress at the beginning of Cycle 2 motivated me to take a more active leadership role than I had intended, as this was somewhat contrary to my expectations and beliefs about collaborative project ownership. I had been reluctant to reinforce ideas of the "academic as expert", "researcher as expert", or "outsider as expert". However, when faced with the choice of assuming leadership or having the project languish, I chose the former. The impact of this decision was dramatic. The inertia that had set in was overcome; I became more energised; and as leader, was able to get closer to ideals for greater collaboration and participation. Previously, I had assumed that increased participation was possible only through joint leadership and decision-making. In reality, however, this view helped to create inertia, and disrupted effective decision-making. Overall, this cycle was pivotal in reshaping my concepts about leadership and participation.

In summary, dilemmas and difficulties continued to feature as this change project proceeded. These gave me a deeper appreciation of the complexities and issues in implementing environmental education in schools in general. The fragmentation of teachers' time and work practices, the political nature of interpersonal relationships and the pedagogical confusion arising from competing, overlapping and often contradictory theoretical frameworks all presented barriers to change. Nevertheless, as this second cycle came to an end, I felt that much had been achieved. A process of inclusive and collaborative professional development helped ameliorate some of these problematic effects. It also helped create teacher support for, and interest in, the project while raising awareness of some of the principles and practices of environmental education. The tangible outcome of the process was a draft learnscaping manual that, by the end of 1998, only needed some minor "finishing off" tasks to make it ready for implementation the following year. Overall, while there was a long way to go towards creating a truly transformative curriculum with this project, the important first steps had been taken.

DEEPENING MY LIVING EDUCATIONAL THEORY ABOUT EDUCATIONAL CHANGE

The third section of this meta-analysis highlights the key issues and themes that emerged during the second cycle of this action research. As new and deeper insights were gained, the process steadily became "less fuzzy" (Dick, 1993). The answers to the "fuzzy" research questions also became clearer as the action research proceeded, reinforcing and expanding the living educational theory that I was developing. Underpinning this analysis was the growing realisation of how complex and difficult curriculum change in a school really is.

Consequently, the study of the events, relationships, plans, and actions of this second cycle, combined with literature review and reflections on research practice, generated an updated set of propositions about curriculum change, professional development and action research, adding to and extending upon those developed in Cycle 1. These are now outlined.

Proposition 1: *Build Social Capital to Ensure Momentum*

Creating social capital relies on the development and maintenance of relationships of trust. Regular contact with project participants is a significant aspect of building trust, as relationships between insiders and outsiders, generally, are rather fragile and may not survive lengthy periods of non-contact. While email is a useful communications tool and can replace some face-to-face meetings, direct contact with teachers remains vital. Undertaking promised tasks, even if not fully completed, also facilitates the development of trusting research relationships. Trust and goodwill encourage continued support.

Proposition 2: *Use Participation to Circumvent Staffroom Politics*

The quality of the relationships between teachers, and between teachers and school administration, is pivotal to project success. Difficulties may emerge in the project that have little to do with the project, but are related to interpersonal issues, rivalries and misunderstandings. While there are no guaranteed pathways to avoiding such stresses and tensions, the development of processes that seek to create common, shared experiences for all teachers, and that involves them in collaborative activities, may help to circumvent some of these micro-political stresses and strains.

Proposition 3: *Challenge Top-Down Models of Professional Development*

Effective professional development should challenge models where experts deliver content to teachers in top-down formats that have little bearing on issues in context. For this project, a model for professional development was created that explicitly sought to address teachers' needs and professional interests. A great deal of dialogue and discussion, prior to the professional development workshops, ensured the content was relevant to the teachers. Additionally, the teachers were valued as curriculum experts in their own right, and hence were invited to contribute to the writing of the learnscaping curriculum. Not only could they choose their own curriculum areas as the focus of this writing, but they were also able to choose with whom they would work. This created dialogue and networking between teachers across year levels, and across curriculum content specialisations. The effect was to strengthening support and enthusiasm for the project, and ownership of its outcomes.

Proposition 4: *Promote Coherent and Critical Conceptions of Curriculum*

It became increasingly obvious that there are many curriculum perspectives and practices operating within a school. While some approaches are complementary, others seem contradictory. Overall, this project has confirmed that there is a general lack of curriculum coherence, which suggests that school curriculum is often whimsical and ad hoc. Equally concerning is the lack of critical curriculum perspectives. Environmental education is invariably just one of a number of "educations" competing for time in a "crowded curriculum". This combination of competition and invisibility maintain its marginal status.

NEW QUESTION AND CHALLENGES

As Cycle 2 drew to a close, I had developed a deeper understanding of environmental education implementation, curriculum change issues, ways of conducting professional development for teachers, and how to practice action research. As the year ended, it seemed that there would also be an end to the development of the learnscaping manual, and, therefore, an end to the project. However, as is explained in the next chapter, this was not to be the case. The events, processes and reflections of Cycle 2 flowed into a new set of actions, inactions and challenges, taking this action research into an unanticipated third cycle. This heralded the emergence of a final question that also needed answering, that encapsulated much of what I had learned and experienced throughout this research journey.

- *Is slow, small-scale educational change worth the effort?*

In the end, finding an answer to this question took another three years, and led to a fresh round of actions and interactions, readings, reviews, reflections and writing. Thus, the end of Cycle 2, instead of being a conclusion to the project, brought new beginnings.

Chapter 6: Learning in the Third Cycle
The Never-ending Story

INTRODUCTION

In the previous chapter I outlined, analysed and critiqued the events, processes and outcomes of the second cycle of this action research. This research confirmed the key conclusion highlighted in Cycle 1 – that curriculum change and innovation are difficult, intricate and fragile processes. In this chapter, I examine the third and final cycle of this project, which was really one very long phase conducted in a rather stop-start manner, and took over three years to complete due to a range of complex personal and contextual factors. As in the previous two chapters, the first part of the chapter contains a narrative account of the cycle, a discussion of the related research processes and protocols, and a summary analysis and reflection over the whole cycle. The second section includes a review of educational change literature that informed and guided the events, processes, understandings and critique in this cycle, and which could be read at this point to avoid disrupting the flow of discussion about the research itself. The final part of the chapter provides a meta-analysis and synthesis of the whole of the three cycles of the study. It contains a description and critique of project outcomes, discusses "lessons learned", and outlines the "macro" characteristics of the project. The chapter concludes with suggestions for embedding this innovation into day-to-day practices of the school so that learnscaping becomes a vital and continuing curriculum component, now and into the future.

CYCLE 3: THE NEVER-ENDING STORY

The first cycle of this action research was characterised as "getting underway", while Cycle 2 represented a "down to work" stage in which it was expected that the learnscaping manual would be completed and the project would end. However, the final writing, editing and publication of the manual did not eventuate as anticipated. Consequently, a third cycle of curriculum development evolved to facilitate the completion of these tasks. Figure 6.1 shows how this new cycle was expected to proceed, with a completion date of June 2000.

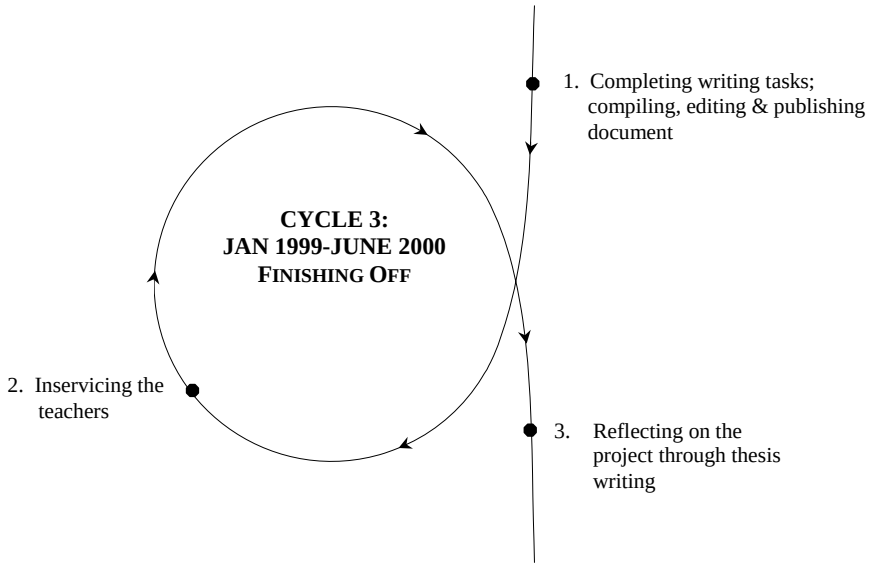


Figure 6.1. The anticipated three phases in cycle 3.

The only major tasks remaining in this cycle were the final editing, compilation and publication of the learnscaping manual, along with some inservice activity to encourage the teachers to use the resource with their classes. I envisaged that my involvement with the school and with the project would soon be completed, finalising this collaborative aspect of my research journey. I anticipated that this would then be followed by an intensive writing phase to complete this thesis.

However, events did not turn out as expected. Cycle 3, in fact, became a "never-ending story", rather than a period of "finishing off". Editing and compilation of *Learnscapes Alive* was seriously delayed, and several times the manual was in danger of not being completed at all. In fact, this third cycle became one long phase – a sequence of overlapping, drawn-out events and actions, with lengthy periods when nothing seemed to be happening. Eventually, however, both the learnscaping manual and the drafting of this thesis finished simultaneously, replicating the beginning of the study when both parts had began concurrently. This third cycle, therefore, is best characterised by the events depicted in Figure 6.2, which shows a single phase, with periods of little or no progress, but with a number of small-scale "action moments" (Zuber-Skerritt, 1992) embedded into the timeline.

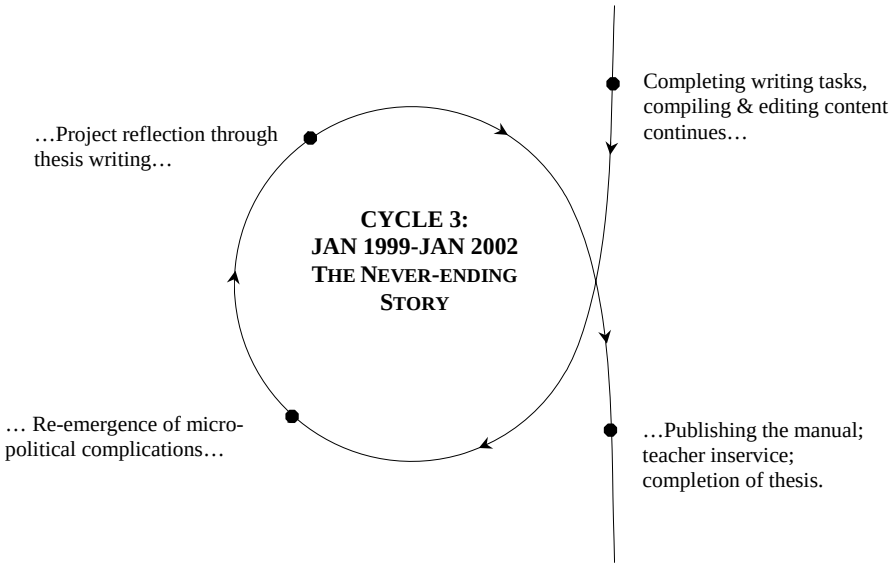


Figure 6.2. The actual final phase of cycle 3 of this action research.

THE FINAL PHASE (JAN 1999-JAN 2002)

The usual end-of-year commitments in the school during late 1998 meant that some of the teachers' learnscaping curriculum plans were not completed prior to the Christmas vacation. Consequently, compilation and final editing of *Learnscapes Alive* were also delayed. Regardless, I thought it would be just a matter of a few weeks before the manual would be completed, and then sent away for publication. I anticipated that the teachers would then begin to incorporate learnscaping into their regular curriculum planning following an implementation workshop early in 1999. Overall, I thought that this project was nearing its conclusion and, with it, my commitments as the researcher-facilitator. I had already decided not to add further to my already extensive data record and looked forward to "signing off" and proceeding with writing this thesis.

Nevertheless, even though the project appeared to be drawing to a close, I continued to reflect upon and critique the project in the "down time" of the Christmas vacation. Again, a period of anxiety and doubt about the project emerged, just as it had at the end of the first cycle. The distractions that had prevented the completion of the project were compounded by my need to prepare two conference papers (Conference papers, Cycle 3, 2/1/99 & 15/1/99).[137] However, because they related to the project somewhat, this intensive period of

[137] These were: "Playing for Life: Early Childhood Environmental Education", presented at the World Education Fellowship 40th International Conference, Launceston, Tasmania, Dec 1998-Jan 1999; and

reflection, critique and writing, gave an opportunity to focus on the niggling uncertainties I was having about the overall value of the project. Ultimately, these doubts, which were centred on the nature and pace of the changes we had achieved, clarified into a new research question as Cycle 2 came to an end:

- *Is slow, small-scale change worth the effort?*

This question reflected the critical concern that had prompted my original interest in this research study – that large-scale, indeed global, change is required for sustainability and that this needs to happen quickly. Nevertheless, while considerable inputs of time, energy and resources had been invested into this learnscaping project, it seemed to be only a modest outcome. Therefore, I was beginning to feel rather disenchanted, even questioning the worth of this and similar environmental education "innovations" when the "real" challenges were so pressing. The resultant disillusionment led to reservations, more generally, about the effectiveness of the contribution of school-based environmental education to sustainability.

The opportunity for new reading, reflection and writing during the extended Cycle 3, however, produced fresh insights and perspectives that challenged this pessimism. Therefore, despite having judged that the changes achieved were difficult, complex, slow and small-scale, I came to a new conclusion – that the project was also innovative and worthwhile.

In reassessing my ideas about the project's success, I concluded that alternative ways of assessing the worth of environmental education in schools are needed. These alternatives need to go beyond the literature of environmental education, and beyond perspectives derived from critical theory. I now believe, for example, that credence should be given to theorising about "change" itself, especially when the complexities and nuances of a specific experience and a specific context are captured by the research process. Furthermore, newer theoretical frames such as change theory, chaos/complexity theory and post modernism,[138] yet to become popular in environmental education literature, can provide interesting and alternative perspectives to understanding how and why the quality and uptake of environmental education in schools might be problematic. This is because these perspectives focus on the complex nature of change itself, and because issues of power,

"Playing and Learning for Life: Innovative Environmental Education in a Primary School", presented at the Australian Association for Environmental Education International Conference, Sydney, Jan 1999.

[138] These ideas are explored further in the literature review in the next section of this chapter, and in the following chapter of this thesis.

"silence" and inclusion/exclusion within a context are investigated in ways that have not been possible with earlier theoretical models. Rather than environmental education projects repeatedly "falling short" against critical criteria, instead they can be reinterpreted as "small wins". Support for the inherent worthiness of small-scale achievements is far more likely to generate new plans and new energy for continued change and innovation, than is critique that emanates from a "deficit" mindset where small-scale initiatives are perceived as failures because they do not seem to make substantial impact.

Overall, while the learnscaping project was in abeyance at the end of 1998 and into early 1999, I was active in "theory work", engaging in reading, writing and reformulating my thinking about the project. However, as the weeks proceeded without news from the school, I realised that the project had stalled once again, so I organised a meeting to find out why. Jo identified a number of causes for the slow-down. First, there was no funding to publish the manual; a number of grants had been sought, but none had been awarded. Another cause for delay was that Ann had taken long service leave in Term 1, with Jo due for similar leave in Term 3. The absence of Ann and Jo, both central to this project and the school's environmental education activities overall, meant that the rest of the staff decided to "take a break" from the *Earthworm Project* in 1999. Without Ann and Jo's motivation and ideas, environmental education was "off the agenda", at least for the time being.

Nevertheless, Jo and I identified several final tasks and publishing options, and we became re-energised by this meeting. The end of 1999 was discussed as a realistic, new finishing time. I completed and forwarded the rationale for the manual to the school in July, and then resumed thesis writing. In Term 4, I contacted the school again, anticipating that the final draft of the manual was imminent. However, even the extended finishing date was not met, as other projects and events, such as a whole school *Eco-Art Exhibition*, were underway. Jo and Ann had also started planning the next year's *Earthworm Project*, another "mega event" with a theme linking "weed-busting", the 2000 Olympics and community involvement and education. As Jo explained:

> *It is part of my personality to totally immerse myself in a project and move on to another one before I have finished the first. You have no idea how many things I have around the place half finished. Will hang in with the learnscaping however as it is a worthwhile project but probably won't really get into it again until the Christmas holidays.* (Email from Jo, Cycle 3, 16/11/99)

During this time Jo also lost the entire master files for the learnscaping project through a computer failure. Thus, 1999 came and went with little progress on the project. I indicated my concerns in my journal:

> *At the moment, things are at a standstill. With no hardcopy, it's impossible to complete the project and then inservice the teachers. I am also worried that other events and the new curriculum changes, such as new KLA syllabi and New Basics*[139]*, might overtake the learnscaping project as a school priority.* (Reflective journal, Cycle 3, 21/10/99)

In February 2000, Jo emailed a request for a testimonial about the learnscaping project to accompany an entry in Education Queensland's *Showcase of Excellence*.[140] This communication also included an invitation to visit the school to help her refocus on the learnscaping manual. At this meeting, I was surprised to learn that considerable work had been completed. Much of the text had been retyped and reformatted after the computer failure, and new materials added. The manual also had an official working title, *Learnscapes Alive*. This again showed how participation in award schemes and competitions can act as a strong motivator.

Most sections of the resource were nearly complete, including graphic design with photographs and page banners. In fact, there was now far too much material with the whole document filling two very large ring binders. We agreed that this would not make for a "teacher-friendly" document. Jo suggested that a "politically neutral person" (Reflective journal, Cycle 3, 6/3/00) would be best to edit the contents as she was reluctant to "bear the blame" for editing out materials that other staff members had provided or developed. I agreed to take on this task as my editing actions were less likely to offend. However, this situation indicated just how delicately poised were the school's internal micro-political relationships, and how these can impact upon curriculum decision-making. Nevertheless, this was a positive meeting that demonstrated that interest in the project and in environmental education generally, was still strong. The following journal excerpt summarises the discussion:

> *Jo noted that a couple of the "negative people" had left the school and that this had had a big impact, as it was now really easy to get teacher involvement. Jo also noted that without the school's Earthworm Project in 1999, the children's attitudes and behaviours, especially of new students, in caring for and nurturing the local environment (looking after koalas, lizards etc), had diminished significantly. This had reinforced for everyone that pro-environment ideas and actions need to be constantly taught and reinforced. Jo commented that the "old kids" didn't/couldn't bring the "new kids" into line – it needed teachers' vigilance, support and power. This realisation showed how important it was to embed environmental education into the school's curriculum activities and not have it as "fringe".* (Reflective journal, Cycle 3, 6/3/00)

[139] This curriculum initiative grew from a critical examination of the existing curriculum framework that supports teaching and learning in eight key learning areas (KLAs). A trial is currently underway that supports "new basics" innovations in curriculum development in a number of schools across the state.
[140] This is a self-nominating exposition of exemplary educational practice in state government schools.

At our next meeting, I presented the following criteria for selecting materials for the manual:

- *Give preference to activities that take children and teachers outdoors;*
- *Select activities that promote understanding of ecological/environmental issues over those more loosely related to the environment;*
- *Select activities to cover all garden areas;*
- *Aim for activities to represent the whole of the Preschool-Yr 7 range.* (Criteria sheet, Cycle 3, 28/3/00)

These criteria were gratefully received, as they would help explain to teachers why some of their materials were not included in the final product. Jo reiterated that this would "take the heat off her", as she could now divert the blame for these decisions to the "environmental education expert". It seemed that we would now move rapidly towards completing the manual. A final review was planned to coincide with Jo's finishing of the word processing and formatting of the materials. In the meantime, I dedicated myself to again working on this thesis.

In July 2000, after a period of study leave, I resumed university duties. This involved a busy schedule of teaching and administration and was compounded by industrial disputation over my promotion and tenure. This situation was stressful and time-consuming and left little time for either the project or this thesis. It was not until a successful resolution was achieved in late October, that I had the time and desire to enquire about the status of *Learnscapes Alive.*

On visiting the school in early November, I learnt that the project had stalled once more. Jo commented that she carried the folder home every weekend but brought it back untouched. A major contributor to this situation was the continuing impact of school micro-politics. In particular, this concerned Jo's involvement in grievance procedures, with her as the "target" of another teacher's complaint. Jo attributed this, at least in part, to professional jealousy arising from her environmental education successes. The negative impacts this action severely affected her motivation.

Though hurt and disillusioned, Jo was nevertheless prepared to continue work on the learnscaping manual, especially when I suggested that I would visit weekly to help keep the project moving forward. However, I became rather disillusioned, as indicated by the following comments recorded in my journal:

> *Jo is still prepared to put energy into the learnscaping program, for which I am really grateful. Without this commitment, we could kiss the last four years goodbye, and this project would become another environmental education initiative to "bite the dust". As it is, I think implementing learnscaping into the curriculum is going to be pretty tenuous. I do not hold great hopes for school-wide uptake of the program, after contemplating the news of this visit.* (Reflective journal, Cycle 3, 9/11/00)

In a subsequent email, Jo informed me that the grievance situation had escalated with three teachers now making a formal complaint against her. Even though I was an "outsider", neither privy to the details nor seeking them, I supported Jo as a "critical friend" during this period because of the respect I had developed for her over the years, and in order to see the completion of the learnscaping project.

These circumstances were highly stressful, especially for Jo, who had been informed that the legal procedures were likely to extend into the new year. While we managed to keep working on the remaining tasks, we realised we would not meet yet another end-of-year deadline. Thus, a second year passed without project completion. My final action for the year before we both went on leave was to write a professional reference for Jo, in response to the grievance case against her.

In January and February 2001, I was involved in a university-sponsored community service project in India. Consequently, it was early April before contact with the school was resumed. I emailed Jo, rather fearful that she might have been transferred or had even resigned, and that the learnscaping project had become a "lost cause". Instead, I was rewarded with a very long email that explained that the grievance was still slowly progressing, but that, far from having "died", the project had had a new "lease of life" and was again nearing completion.

During my absence, Jo had pursued publication options, including print, CD-rom and web publishing. The latter prospect led to considerable investments of time seeking copyright clearance for some of the published materials to be included in the manual. Our first meeting for 2001 was very buoyant, with significant progress in evidence. However, the new tasks associated with copyright clearance again delayed setting the final publication date. As past experience had shown, both of us then became involved in other projects, as well as our many work and family commitments, which took us away from completing the final tasks.[141] In early November 2001, Jo emailed that publication costings for the manual

[141] For example, the school submitted entries for the *Green and Healthy Schools Award*, winning a regional title; the Minister of Education's *Young Legends Award*, which it won; and also the Readers' Digest *Environmental Award*. In addition, progress on the complaints against Jo were moving slowly as Jo sought her own legal advice.

were being sought and that school funds had been approved for the printing of fifty copies. Minor adjustments to formatting and layout meant that printing finally occurred after school finished, in late December 2001.

In the meantime, Jo, Ian and I discussed possibilities for a workshop to familiarise the teachers with the contents of *Learnscaping Alive* and to enthuse them for environmental education. This occurred on the pupil-free day on 25 January 2002, five years after initial discussions about this curriculum project had began. The project was over!

Research Processes and Protocols

As this narrative shows, this was a long and tedious final cycle, during which my interest in continuing to document the project began to seriously falter. The stop-start nature of my engagement, and the fact that there were so many false endings, impacted quite drastically upon what had been assiduous attention to data collection and record-keeping. While I continued to add to my data record by archiving emails and filing notes and other materials related to the project, I found it difficult to maintain interest in writing the detailed journal entries that had been such an integral part of earlier cycles. Personally, I found the events and emotions related to Jo's disputation quite difficult to contemplate. I have labelled this whole experience as one of "researcher fatigue". The intensity and engagement of the first two cycles of the project contrasted so sharply with the glacial pace and impediments of the final cycle that I could not motivate myself to record more than the briefest notes of meetings and events. While this robbed this final discussion of some richness and detail, this brevity depicted my genuine ambivalence towards researching this project at this time. To be frank, this "avoidance" strategy spared me some of the emotional swings between hope and despondency that dominated this cycle.

While not enthusiastically recording or creating new data, however, I remained a committed project participant, keen to see the manual published and in use. My role shifted from being a key facilitator to being primarily a support person. Technically, I was involved in quite mundane administrative tasks, such as gathering and collating materials, editing, and generally assisting in decisions about the nature of the finished document. On an interpersonal level, however, my presence as a listener, prompter and motivator was very significant, especially as the impacts of Jo's industrial disputation escalated, as the following excerpt from an email from Jo indicates:

> *Thanks for coming down to school the other day. Your presence, patience, encouragement, ideas, commitment, listening ear, knowledge, etc, etc, are greatly appreciated, and I don't*

> *think I say this enough. Without you the environmental education program would certainly never have gotten as far as it has. Thank you again.* (Email from Jo, Cycle 3, 13/4/01)

However, researcher fatigue and the demands of other components of my life prevented me from consistently taking on this supporting role. I found that when I disengaged from the project, it stalled. When I set dates and attended meetings, tasks were completed. It became obvious that face-to-face meetings prompted renewed activity, helping both of us to overcome our inertia and disinterest. However, there were periods when I did not contact or visit the school, instead, choosing to focus on this thesis or some other work or family responsibilities. In effect, I ignored one of my own early conclusions – that process underpins progress in action research. This realisation reinforced the notion that action research is located within, not separate from, the contexts and issues of people's everyday existences; it is as much a product of unplanned and adventitious occurrences as it is of intentional decision-making.

Analysis and Reflection

This three-year cycle was a time of "highs and lows" where I was often frustrated by long periods of inactivity and unfinished business. I had reached the point where I wanted closure on the project because of its interference with other aspects of my life and work, especially diversion from writing this doctoral report. In effect, *Learnscapes Alive* had become an "albatross". I wanted it finished but no longer wanted to put in the effort to get it completed. Inevitably, this resistance only further extended the project's time frame, which increased my frustration and created further blockages.

However, I do not accept all responsibility for the slow pace of this final cycle. We were, after all, a group of volunteers who had conducted the project mostly in our "spare time". Furthermore, the project had been a partnership, even though I took on a key facilitation role. Managing the typical pressures of schooling, as well as new demands – for example, handling children's challenging behaviours, implementing new and mandated syllabuses[142] and learning to use computer-based technologies – impacted significantly on the extent to which school members could invest their time into the project. This was exemplified by a comment from the principal who indicated that he and Jo had resorted to sending emails to each other and "waving at a distance", in order to maintain some semblance of personal communication during this increasingly busy period (Reflective journal, Cycle 3, 21/4/99). When combined with more personal experiences, such as Jo and Ann taking long service

[142] Education Queensland released three new mandated syllabuses for state schools between 1999 and 2001 - *Science, Health and Physical Education* and *Studies of Society and Environment.*

leave, my trip to India, and Jo and I both being involved in industrial disputation, it is little wonder that finalising the project became such an effort.

These constraints aside, however, the project did inch towards completion with Jo and I providing mutual support in maintaining each other's interest and motivation, as the following email communications reveal:

> *Thanks for all the EE stuff. You are a treasure…. Thanks for all your hard work… now it is time for me to do some… to hold up my end.* (Email from Jo, Cycle 3, 13/8/99)

> *How's the learnscaping manual progressing? Do you need a visit from me to boost the task along?* (Email from Julie, Cycle 3, 14/7/01)

Nevertheless, while there were difficulties and frustrations associated with completing the practical aspects of this action research, I was still making reasonable progress with thesis writing. Indeed, it was my encounters with, and reflections upon, areas of literature that I had not previously explored that enabled me to cope with the project's slowness. This literature, reviewed in detail in the next section, focused upon school and educational change. The knowledge and ideas that I gained from this exploration helped significantly in reducing my levels of agitation and impatience about the project, even enabling me to take some satisfaction and pride in what was achieved. As a result, I now apply to the project a key concept derived from this literature, and based on my experiences and later reflections – that this learnscaping project is a small, but significant, "win" for the school, for environmental education, for education, and for sustainability.

While this particular project has now been completed, however, it is in its use that it becomes important. According to Hargreaves (1997c) educational projects need to "go deeper and wider" (p. 1), to capitalise upon the time, resources, emotions and energies that are enlisted for their completion. I now have some confidence that this depth and breadth will indeed happen, both within the school and beyond it. During the implementation workshop, for example, a number of teachers made public remarks signifying the importance of building learnscaping principles into their day-to-day interactions with students. The following comment is indicative:

> *One of the teachers commented that what I had written in the rationale showed that environmental education was not an add-on; that it had to be incorporated into daily teaching. I was thrilled at these comments coming from one of the staff members, because this was a key purpose of the project – to encourage teachers to embed environmental education and learnscaping into the heart of what they do.* (Reflective journal, Cycle 3, 25/1/2002)

This does not necessarily mean that changes in teaching practice will ensue, but it does reflect a willing intention. Continued support and encouragement from the principal, Jo, Ann and others is now needed to see that the project does "go deeper" through application of learnscaping into all teachers' day-to-day practices. I have little doubt that this support will be provided. In terms of "going wider", I also have cause for optimism. Even in this early phase of *Learnscapes Alive*, ambitious plans were being made to capitalise on its completion and to expand its reach beyond the school. Ann suggested a whole school environment project to celebrate both the completion of the learnscaping resource and to acknowledge 2002 as the International Year of Eco-tourism. In fact, a similar idea had been raised at the beginning of the project in 1997 but had never been actioned. The plan is to develop a whole school "rich task",[143] centred on the development of a guided walk around the learnscape circuit (Plans for 2002 project, Cycle 3, 25/1/02).

For this task, Ann has suggested that each class be allocated a section of the circuit, which they can research for its interest to visitors, such as students and teachers from other schools. Discussions about visitor requirements, visitor rules, appropriate signage, ways to reduce or ameliorate human impacts on the grounds and gardens, suggestions for improvements to the area, would all be part of the rich task. Each class's plans would be compiled into a brochure that mapped a journey around the school. To support this walk, a video would also be created that showed students engaged in integrated, environmental learning activities and projects, many being suggestions from *Learnscapes Alive*. It is anticipated that students would also act as guides for the walk, demonstrating their knowledge, ownership and involvement with the learnscaped areas. A further proposal for this learnscaping eco-tourism project was the development of a "virtual" field trip where "travellers" who were unable to access the school in person would be able to participate via the school's website. As with other aspects of this learnscaping rich task, this internet-based experience would be developed with maximum contribution from students. Ambitious though these plans seemed, I wrote in my journal after the workshop:

> *The school has the learnscaping manual and has big plans for continuation of the project. Susan reiterated that the school has an obligation to share what they have done with other schools and the wider community. These were terrific words to hear – the potential of this "small win" to make a bigger impact is evident…. I have no doubt that the school will pull this off!* (Reflective journal, Cycle 3, 25/1/2002)

[143] Rich tasks are the assessable and reportable outcomes of a three-year curriculum plan, *New Basics*, which allow students to display their understandings, knowledges and skills through performance on transdisciplinary activities that connect to the students' real world. For Years 1- 3, for example, there are 5 rich tasks including student investigations of a threatened Australian plant or animal and the extent to which it is threatened. This investigation is then used as the basis of constructive action, and the creation of a persuasive and informative multimedia presentation for others.

As this cycle and this project were coming to an end, a new phase in its evolution was already beginning. The development of *Learnscapes Alive* had been long and complicated. No doubt the next phase of consolidation and outreach will also strike difficulties. However, based on the knowledge and experiences developed during the past five years of this action research, I have reasons to hope that slow, but effective change will continue to build, broadening and deepening the shifts that are already underway.

LITERATURE REVIEW: SCHOOLS AND EDUCATIONAL CHANGE

Because of long periods with little happening "on the ground" during this cycle, I continued to reflect upon the situation and to research the literature in order to better understand what was taking place. This section provides an overview of the key areas of literature reviewed during this time, centring on recent discussions about school and educational change. Also examined were related themes, including change theory, schooling culture, and the nature and role of professional development in facilitating change.

RETHINKING EDUCATIONAL CHANGE

A common viewpoint within the environmental education field is that the lack of significant adoption of the values and practices of transformative education represent a mismatch between theory and practice (Robertson & Krugly-Smolska, 1997; Robottom, 1987a; Spork, 1992; Wals & Alblas, 1997). Critical theory has been used to explain this issue (Fien, 1993; Huckle, 1993). However, critical theory has not been viewed as being all that helpful in provided strategies for implementing critical approaches to education, including environmental education, especially in terms of overcoming the historically embedded conservatism of schooling. Gibson (1986), for example, has commented that critical theory has been "long on analysis and short on prescription" (p. 61). This perceived failing of critical theory has been interpreted by Walker (1995) as a need for a radical redefinition of the theoretical foundations of environmental education. Others, such as Lotz (1996) recognise the value of critical theory but suggest that it might be only partially adequate for dealing with the increasing complexities and changing internal and external environments that are pressuring contemporary schooling. The perceived rhetoric-reality gap might be explained, then, more by the narrow and static definitions of critical theory held by some environmental educators, than by inadequacies in critical theory itself. Instead of discarding critical theory, Lotz makes a cogent case for a "new" critical theory, that embraces recent additions to social theory such as post-modernism, while Hardy (1996) suggests that chaos theory is worthy of examination for environmental education.

In support of this latter view, Gunter (1997), Jensen et al. (1996) and Larson (1999) have reshaped critical theoretical perspectives about educational change. Jensen et al. (1996) write that in a great deal of current *sociological analysis* [their italics] about education, it is common for teachers to be seen as social agents, the bearers of societal traditions and values, and the distributors of socially approved knowledge and skills. In much of this analysis, they claim, the teacher's role and function is reduced to that of a conservative caretaker working towards the reproduction of labour power. In contrast, they contend that much *pedagogical or curricular analysis* depicts teachers as potential innovators, who have power to make changes in the form and content of their work and even to generate new ways of working.

In the first of these views, Jensen et al. (1996) suggest that there is an over-estimation of teachers' involvement in cultural mediation and an under-estimation of their ability to transform culture. In the second view, they contend that the reverse applies – mediation is under-estimated and potential to create is over-estimated. These authors claim that *both* engagements need to be recognised, with acceptance that teachers function in schools "neither as bounded social robots nor as boundless cultural inventors" (p. 21). Thus, drawing on critical theory and cultural theory, they claim that praxis becomes the site where conservative tendencies and transformative potential are both realised and balanced. The impact of these two simultaneous tendencies is that educational change is likely to be slow, incremental change rather than a wholesale or fundamental reshaping and restructuring of schools and their practices, at least in the short-term. In other words, change is evolutionary rather than revolutionary.

Accordingly, rather than ascribing the perceived absence of social change to the failure of "transformative educations" such as environmental education, the "failure" may rest, instead, with the way that change is perceived. Proponents of chaos theory[144] reach the same conclusion about the pace and scale of change. In short, chaos theory suggests that the many small-scale changes that are happening in schools and elsewhere, need to be recognised and appreciated as examples of successful change. This proposition implies that chaos theory has a contribution to make to new theorising about (environmental) education.

To reiterate, the application of newer thinking about organisational change suggests that educational change *evolves* from what already exists – from the history of the organisation and from the people interacting within it (Larson, 1999). Cuban, in an interview with

[144] This theory is examined in more detail later in this chapter.

O'Neil (2000) refers to this as "tinkering towards Utopia",[145] where tinkering with the system leads to reforms that are typically gradual and incremental, and "Utopia" is the vision of a just society. Tyack and Cuban (1995) elaborate that what is critically important in creating change is the *process* of change, the combination of tradition and innovation, underpinned by the quality of the people and relationships already in an organisation. Contexts are rarely transformed by mould-breaking design, radical shifts, or brought about by new leaders with new ideas and visions. For schools, this means creating change from the inside out, focusing on building teachers' relationships with each other, enlisting their support and skills as key actors in reform, and celebrating their small wins (Larson, 1999).

While this may not appear to be an idea of much consequence, Tyack and Cuban suggest that it is the hardest change to achieve. It is also the most important as it is with teachers and their relationships that educational changes start and are sustained. Thus ways need to be found to encourage listening, dialogue and collegiality amongst staff (Fullan, 1999; Greig et al., 1989; Hargreaves, 1997a; Larson, 1999; Tyack & Cuban, 1995). It also means finding ways to engage the resistors, mavericks, doubters and the marginalised in an organisation, as they are as much a part of the cultural fabric as are the leaders, innovators and enablers. Real and lasting change becomes most likely when relationships between members of an organisation are problematised and consciously enhanced because they are viewed as integral to the change process. As Donohoe (1997) states, "If culture changes, everything changes" (p. 166).

This final component of literature review explores this new thinking and theorising about change and innovation and applies them to school and educational change, and to environmental education. This discussion emphasises the role of teachers in creating change and the place of teacher professional development in this process.

Problems and Complexities of Educational Change

Hargreaves (1997b) states that "educational change is everywhere. Never have so many schools and their teachers had to deal with so much of it" (p. vii). Many of the recent changes, he comments, are the result of policy demands emanating from new technologies, partnerships with business, value-added accountancy, performance-based assessments, a broad range of subject-specific initiatives, and pressures for reform in order to capture or maintain "market share". However, there are also important changes resulting from schools trying to improve themselves. These "bottom-up" changes, he notes, have been informed by

[145] This is also the title of a book by Tyack & Cuban (1995) *Tinkering towards Utopia: A Century of Public School Reform.*

improving knowledge about successful approaches to teaching and learning, and by a developing body of research and literature on the processes of school improvement.

Educational change is not easy, however, with many writers articulating the numerous problems, difficulties and dilemmas (Elliott, 1998; Fullan, 1997; Hargreaves, 1997c; Larson, 1999). Recent discussion about these issues acknowledges that organisational change is complex, dynamic and unpredictable; but rather than being obstacles, these elements are the normal attributes of change. Change in dynamically complex circumstances is also non-linear, argues Fullan (1997) and cannot be predicted or guided with any precision. As a consequence, there is "an overwhelming sense of despair that the problems are insurmountable and worsening" (p. 217) and a growing feeling amongst many teachers that the public and the government do not care about them.

Among the fundamental problems, continues Fullan, has been a growing and deepening alienation amongst teachers, the "Balkanization" and burnout of passionate reform-minded teachers, and the overwhelming multiplicity of unconnected, fragmented change initiatives. This has resulted in teachers becoming cynical and disenchanted with reform agendas, which unfortunately creates further gaps between "reformers and resisters". This inevitably results in a further reduction in the number of teachers committed to change. Therefore, concludes Fullan (1997) current strategies, be they "top-down, bottom-up, or sideways don't work. We need to step back from this conundrum and approach it differently, more basically, and … paradoxically" (p. 219-220).

Hargreaves (1997b) maintains that one of these paradoxes is that while large-scale macro changes are often driving changes in schools, it is improvements of the internal micro interactions and relationships, which parallel these changes, that are generally of greatest importance. He continues that we should "talk less about *restructuring* schools than *reculturing* them" (p. 1). He comments that how teachers work with each other has the greatest effect on how they work with students. The importance of focusing on teachers' needs is also reinforced by McCormick in Gough (2000) who argues that where principals focus too heavily on visionary goals for the school, teachers and students become less motivated. Instead, teachers were most satisfied and motivated by a principal who concentrated on them as individuals, working on the principle that if you "look after the individual, you build the group" (Gough, 2000, p. 15).

Hargreaves continues that, as a consequence of such research findings, there is less concern with how teachers commit to other people's changes than with how schools might become

places that stimulate and support teachers to make changes for themselves. He reiterates that "cultures of teaching should be a prime focus for educational change" (p. 1). A central tenet of creating these change cultures is how to build the personal resources of teachers and how to develop collaborative working relationships between teachers and principals, and among teachers, rather than focusing on the goals, visions and outcomes of changes often mandated by others.

New Theories about Educational Change

The evidence from recent research supports moving away from institutionally mandated reforms, which have tended to concentrate on management issues and broad generalisations, towards those directed at teachers (Fullan, 1999; Hargreaves, 1997a). As Tyack and Cuban (1995) state, "policy elites have often bypassed teachers and discounted their knowledge of what schools are like today" (p. 135). Instead, locally generated, school-based, teacher-directed educational change, that explores the complexity of issues faced by teachers operating often in disadvantaged circumstances, is beginning to become the norm. In general, this shift reflects the influence of new theories about change, especially "new" critical and postmodernist theories that explore concepts of diversity, equity and power, and chaos/complexity theory,[146] the latter of which is explored in detail later in this review of literature. As Fullan (1999) argues, such new theories bring congruent resources and ideas that may be helpful in producing the comprehensive and equitable reforms that have eluded many educationalists to date. This is important, he says, because, "despite the consistency and specificity of research findings on the impact of collaborative work cultures and professional learning communities, we do not seem to be gaining ground on educational reform" (p. 227). As Hargreaves states, educational change needs to "go deeper and wider in quest of success" (p. 1).

Hargreaves suggests that this calls for increased understanding of how to create collegial relationships amongst teachers, an area that much school improvement literature has failed to address, and an understanding a school's power relationships, a key tenet of postmodernist theory. Such tasks require issues of diversity, equity and power to be problematised, the development of mutual empathy and relationships across diverse groups, and a recognition that many reforms are not in the interests of those in privileged positions within a school. It is only through these kinds of internal changes, claims Fullan (1999),

[146] "Chaos" and "complexity" are interchangeable terms, but "complexity" is preferred because it more accurately describes the phenomenon than does "chaos".

that the "moral purpose" of education – increasing the life chances of *all* students – can be realised.

Complexity Theory

In addition to contributions from postmodern theory, complexity (chaos) theory[147] is also beginning to affect current thinking and practice of educational change. Chaos theory, which has shaken understandings about the natural world in recent times, seeks to explain the uncertain and unstable nature of change. Indeed, Gleick (1987) refers to chaos theory, along with investigations of relativity and quantum mechanics, as leading "the third great revolution in the physical sciences" (p. 6). Its origins lie in investigations of the physical world enhanced by computer modelling, but in recent times it has been applied to understanding the social world with extensive take-up, especially, in the field of organisational management and change (Parker & Stacey, 1995; Stacey, 2000; Wheatley, 1992), along with considerable interest from educators (Doll, 1993; Garmston & Wellman, 1995; Gunter, 1997). A complexity-oriented view is a rethinking of how systems – such as the weather, the stockmarket or a bouncing ball – work. Previously, it was believed that these moved in predictable, linear ways, in which orderly causes lead to orderly effects, towards a state of equilibrium. However, the creative role of disorder and irregularity are emphasised in non-linear complexity theory. Deterministic natural laws are now understood to operate in a circular way in which disorder leads to order and order leads to disorder. A simple, steady-state view of the world has been replaced by a complex and paradoxical one where the future is unpredictable (Parker & Stacey, 1995).

When a "complexity" perspective is applied to human systems, only the day-to-day organisational issues, such as timetabling or budgets, are seen as controllable or able to be managed by step-by-step analytical reasoning or planning. In this view, the unpredictable nature of the future cannot be planned in the long-term, and long-term planning procedures will only be achieved, occasionally, by chance (Stacey, 2000). The future, however, is not random or completely uncontrollable, but seen as having "bounded instability"[148] which indicates that long-term issues have the potential to utilise a creative or complex management approach. Central to this perspective is appreciating how systems co-evolve by a creative process of policy and organisational modification. This is the "butterfly

[147]Investigations of change in dynamic systems reveal that iterations of deterministic, non-linear functions can produce complicated behaviours that appear random, but which have an underlying determinism. Random behaviour controlled by deterministic laws is the paradoxical definition of "chaos".

[148]Gunter provides the analogy with the weather, where patterns are unpredictable, but are within a boundary defined by the seasons. While it cannot be predicted whether there will be sun or rain on Christmas Day in Brisbane, for example, we can recognise patterns, and therefore predict that it will not be cold and snowy!

effect"[149] which explains how small perturbations or modifications are created, the effects of which are difficult to know, let alone determine, but which can have large-scale impacts. According to Stacey (2000) long term development that takes account of complexity emerges by spontaneous self-organising evolution, requiring political interaction and learning in groups, rather than from systematic progress towards predetermined goals or "visions". It is through such devolved and inclusive processes that managers create and discover their environments and the long-term futures of their organisations. Doll (1993) comments that complexity theory has the potential to contribute to a deeper understanding of the education dynamic and will help the educational field enter the post-modern era.

In tandem with these ideas about how change is created in environments of uncertainty is reformulation of how quality actions are to be judged. Older theories about change assume that the criterion for selecting a quality action is its outcome, because it is assumed that quality actions will produce the desired outcome. In an unpredictable world, however, outcomes cannot be known in advance; therefore it is necessary to act and then deal with the consequences (Stacey, 2000). This does not make action impossible or futile, however. Instead, it means that actions are selected on the basis of alternative criteria for quality. In a highly uncertain world, a quality action is one that keeps options open for as long as possible. Another criterion for a quality action is that it enables error to be detected faster than some other options. It is also one that creates a position from which future actions are possible. Most importantly, Stacey indicates, quality actions are moral and ethical in nature. "An action may be taken without knowing its outcome simply because it is judged to be good in itself" (p. 411). One is not absolved of responsibility because the outcome is not known, however. Even if one does not know how an action will turn out, its outcomes still have to be dealt with. Overall, it is not a specific outcome of an action that is important but the range of possibilities that can be generated from an action.

Gunter (1997), who is also an advocate for the application of complexity theory to education, critiques the early work of educational change "experts"[150] and claims that they have been largely rooted in non-complex, Newtonian precepts of stable systems and linear "cause and effect" relationships. As a consequence, she suggests, there has been a retrospective view of education "and the perceived need to return to the golden age when long-term planning was predictable and all you had to do was teach" (p. 84). "Back to basics" where history determines the future, represents one such example. Common

[149] This term derives from the "half-joking" idea that the impact of a butterfly taking flight in Tokyo today may transform storm systems next month in New York (Gleick, 1988).
[150] This includes the early work of Fullan and Hargreaves who now embrace the notion of "complexity".

strategies see management as about controlling change by adopting the tools of strategic management, quality management and business planning, and advocacy for control mechanisms, such as targets, success criteria, action plans and progress checks to maintain stability and to meet the needs and wants of parents and children. Such linear approaches are far too simplistic and inadequate, declares Gunter, and deny the real complexity of human interactions and relationships. By contrast, if complexity, instead of stability, is applied to an educational organisation, the future is not created by systematic installations of new structures, goals and tasks, but by the sensitive response to fluctuations in the environment. Complexity theory "enables us to understand that you are not necessarily out of control if you are not in control" (Gunter, 1997, p. 86).

A major benefit of complexity theory is that it enables leaders of educational change to break with the belief that solutions to educational problems require determined application of rationally organised expertise. Gunter stresses that problems cannot really be solved, anyway. Instead, "We create, we inherit, we define and we redefine problems. We can put in place short-term measures to deal with manifestations of the problem but we cannot "clear it up" or "settle it" or "close the book"" (Gunter, 1997, p. 86). She reiterates that an obsession with problem solving is actually counterproductive, and that the suite of problem solving approaches such as consensus value systems, collective goals, shared vision, and collegiate team structures, give false comfort. Rather, it is the issues from which the problems are created that require investigation and from which choices for the future will unfold. Recognising that problems in social processes are non-linear, that cause and effect are distant from each other, and that history helps shape the present, enables the conceptualisation of education as a complex system in which a full interplay of regenerative forces can take place, rather than a narrow range of linear problem solving strategies. As Wheatley writes of her personal experiences of educational change, "the universe will not cooperate with my desires for determinism" (cited in Gunter, 1997).

In contrast to deterministic approaches to educational change, Gunter advocates an "action-thinking-action" approach, in reality an action research strategy, as offering a solution because it is based on decentralising the location of, and the authority for, knowledge. In such an approach, people do not simply respond to their environment; they also create it. Rather than simply meeting needs, what schools can offer is the shaping of future needs for students and communities. This is the new role of educational managers as interventionist. They understand that small changes have a considerable impact over time, as creative

strategies emerge from instability in a seemingly unintended, uncoordinated manner to create new patterns, new interactions and new knowledge (Stacey, 2000).

While the investments of time and energy in such dissipative structures are high, the resulting turbulence need not interrupt or interfere with everyday functioning. When people find themselves in new situations they learn while adjusting to the changes, and use previous activities to develop meaning and new strategies for creating the future (Stacey, 2000). Thus, "new knowledge" can be developed from existing interactions, relationships and networks, because the thinking skills or "intellectual capital" of workers is harnessed as an essential resource. Stacey (2000) and Gunter (1997) both assert that central to the "complex" approach is recognising the importance of human relationships. How a workplace organises its relationships rather than its tasks, functions and hierarchies, is of central interest. Therefore, effectiveness is not just about measuring up to external and imposed criteria, but about professional judgement and professional standards.

The implication of complexity theory for schools undergoing change, says Fullan (1999), is that success will operate away from equilibrium, always vacillating between stability and disorder, at the "edge of chaos" (Stacey, 2000). Within a system that is evolving, uncertainty is seen as inevitable and creativity, innovation and change are normal rather than aberrant. Thus, the "new, more complex ways of thinking, represented by these (new) theories, provide profound, liberating and inspiring possibilities for individuals at all levels of the system to understand better and to act much more effectively" (p. 12). Through the use of management behaviours developed through self-organisation, rather than managerialism, such alternative approaches to innovation, learning and leadership are seen as far more likely to foster significant educational reform than have past reforms. However, appreciating that these reforms start slowly and are of small scale is pivotal.

Larson (1999) argues that one way to develop appreciation for the "small win" is to challenge conventional ideas and beliefs about how change *should* happen. He comments that customary wisdom and traditional management theories imply that rational decision-making follows only those actions suggested by the goals of the organisation, that thinking should precede action, and action relates to the mission of the school. This conception, he suggests, is deeply embedded in our culture and stresses planning and orderly change. However, he suggests that:

> Sometimes, we are successful in following convention, but … the sensible approach does not have a starry history within the organised anarchy and busy kitchen features of educational organisations. In addition, the usual approach, given the hectic and fragmented

> pace of work, demands too much time and information from decision-makers and assumes that most of them share the same predominant goals. (p. 84)

Underscoring this point of view, Fullan argues most forcefully that traditional theories and practices in implementing educational change have been largely failures. He comments "wishing for, waiting for, and urging the system to be more rational is in itself irrational – it won't happen" (1999, p. 97). Hargreaves (1997b) also emphasises the failures of past and current educational reform movements, and stresses that new ways and new values are needed to underwrite change processes if they are to be successful.

In general, it is the predominance of a technocratic view of change that came in the 1970s and 1980s that is challenged by Larsen (1999) and others (Elliott, 1998; Fullan, 1999; Nias et al., 1992). Elliott refers to this as an "engineering model" of change, equated with an engineer designing a system to fulfil a particular function and then supervising its implementation. The plan enables the engineer to control the process by communicating his/her requirements to the workforce and providing criteria for monitoring and supervising progress. This approach emphasises rationality of behaviour and follows good planning process. This view of change, however, fails to take into account the complexities of human action and interaction.

In supporting a cultural perspective on change that recognises complexity and reinforces the value of the small win, Larson (1999) comments that such a view liberates us from the narrow focus of how organisations should behave, according to rational theory. As Clark and McKibbin (1982) state "rational decision-making processes can be observed in schools; so can accidents" (cited in Larson, 1999, p. 84). A cultural perspective allows us to see the "accidents" and deviations as more than anomalies and recognises our limited rationality within situations that are increasingly ambiguous and unpredictable.

Educational Change is Cultural Change

Like Jensen et al. (1996), Larson (1999) advocates a cultural approach that takes complexity into account to understanding school change. This is a view that is beginning to receive more emphasis as a way of explaining how change "really" occurs in organisations, and is supported by a growing number of writers in the field of educational and school change (Ball, 1987; Fullan, 1999; Hargreaves, 1997c; Tyack & Cuban, 1995). Elliott (1998) refers to this as "a vision of curriculum reform as a social experiment" (p. 35).

A cultural view emphasises the importance of context in terms of the shared beliefs, norms and values held by groups of participants in that context. Because all individuals in a school

work within groups (and sub-groups such as Maths, Science, Language, or lower, upper and middle school) as well as in groups identified as “administrators” or “teachers”, deep gaps of understanding and meaning may apply where the respective norms, values and beliefs of these groups differ from those of the total organisation (Larson, 1999). Shaped over time, these group features can become cultural “guideposts” for the behaviour of group members, reinforcing shared values and behaviours and thus preserving the status quo. While group beliefs may become similar enough so that people in different groups can work together fairly effectively, they can also become magnified so that the organisation is rife with conflict, controversy and uncooperativeness. Brown and Eisenhardt (1998) claim that adaptation is most effective in systems where groups are only partly connected as “too much structure creates gridlock, while too little structure creates chaos” (p. 14). The key to effective change is to stay poised on the “edge of chaos”. Recognising that schools are culturally complex organisations also means recognising that, instead of consensus, consistency and uniformity being the modis operandi, unpredictability, clashing counter-cultures, contention, conflict and inconsistency rule the day (Stacey cited in Fullan, 1999).

From a cultural and complexity perspective, educational change can be expected to be evolutionary rather than revolutionary. This is because of the enormously difficult task of achieving a shared purpose or agreement on a common change process unless change is imposed, in which case the change is even more likely to be troubled and have less guarantee of success. As this study has illustrated, change is an adaptive process not an event – a highly personal experience, accomplished over time, primarily by individuals. It entails personal growth and personal difficulty. To reiterate, educational change is best understood in terms that focus on individuals, the innovation itself and the context, rather than the process of change.

A change model (Figure 6.3) proposed in 1978 by Berman and McLaughlin and adapted by Larsen (1999, p. 66) indicates that change does not move in a linear fashion from one discrete stage to another but is a highly interactive, “snarled” process, encompassing three phases – mobilisation (adoption, initiation), implementation, and institutionalisation. All three phases usually occur at different times and with different people. Change unfolds recursively; it does not simply stop and start. This pattern reflects the nature of the change processes experienced in the three cycles of action research described in this thesis. It also identifies that the learnscaping project has passed only through the mobilisation phase, with implementation and institutionalisation still to occur.

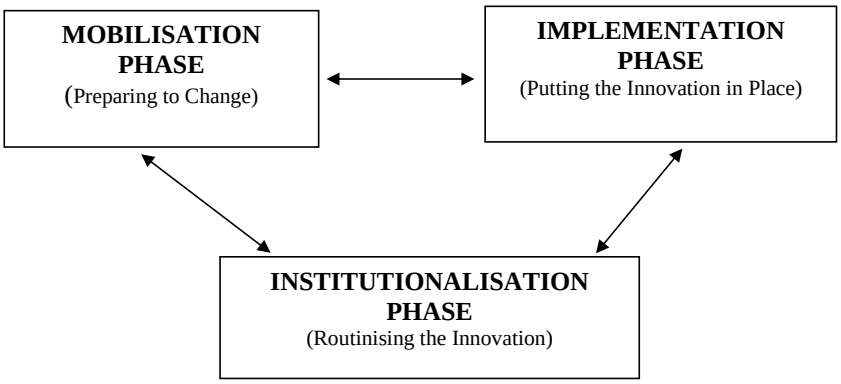


Figure 6.3. The three phases of change in a non-linear change model.

In seeking to further explain the slow nature of educational change, Larson (1999) argues that innovations are also altered as they are implemented. This helps achieve an improved fit to the local context and to serve the interests of the many groups in the setting. These continuing variations, however, further slow the processes of change. The expectation for this learnscaping project is that the implementation phase will also be slow, especially as there will be new groups and sub-groups formed within the school who will also seek to influence the shape of the innovation and the processes of its implementation over the next few years. Group cultures, as they exist in schools, states Larson, tend to inhibit organisation-wide changes but can, and do, nurture small-scale improvements. While small-scale innovations result in fewer organisational changes and have fewer impacts, they are nevertheless important because they are low risk, they increase motivation and are more likely to lead to action (Louis & Miles cited in Larson, 1999).

NEW WAYS FOR EDUCATIONAL CHANGE: "GOING DEEPER AND WIDER"

A central theme that has emerged from this literature review about educational change is that the quality of human relationships and interactions, rather than structural or organisational configurations or plans, are highly significant in creating change. Developing enhanced ways for teachers to interact with each other, with students and with their communities to improve professionalism, pedagogy and commitment to change are seen as significant. These are especially so because of the apparent chaos and disillusionment that is overwhelming many teachers in the face of the intensified change forces impacting on education, specifically, and society in general. To return to an earlier theme, new ways of bringing about educational change that go much deeper and wider than previously are needed, so that schools can deal with and thrive in this era of complexity and challenge. This section examines what "going deeper and wider" means.

Going Deeper: Developing Emotional Intelligence

Hargreaves (1999b) comments that "more depth" is needed in educational change theory and practice because most educational change "doesn't really get to the heart of what children, teachers, and parents care about and do, or what moves them to do things better" (p. 2). In line with the renewed emphasis on understanding and building relationships, he now considers that most educational change processes in schools fail to develop the kind of "emotional intelligence" (Goleman, 1995) that adds value to students' classroom learning and teachers' professional learning. Consequently, Hargreaves suggests, efforts "to put the heart back" (p. 2) into change processes are necessary. This means recognising teachers' emotions, particularly anxiety, and working consciously to create hope and purpose. Fullan (1999) also strongly supports this view and comments that it is the capacity not to panic and to find ways and resources to address difficult problems, that is urgently needed to help teachers survive and thrive in the "complex and chaotic conditions of postmodern life" (p. 221). As Goleman (1995) comments:

> From the perspective of emotional intelligence, having hope means that one will not give in to overwhelming anxiety….Indeed, people who are hopeful evidence less depression than others as they manoeuvre through life in pursuit of their goals, are less anxious in general, and have fewer emotional distresses. (p. 87)

Listening to teachers, encouraging their steady reflective efforts as practitioners, and supporting their genuine collaboration and networking, are the key elements in creating change and innovation, because they are communicative, social processes aimed at overcoming alienation.

The Role of Enthusiasts, Resisters and Mavericks

It is argued by Fullan (1999), Gunter (1997) and others that a major reason why change is often impeded or fails is the role played by resisters or mavericks. These include staff members who passively ignore change, those who actively oppose change, those who may even seek to sabotage a change or innovation, and those who implement "alternative" changes. While a great deal of literature has focused on the pivotal role of initiators and enthusiasts in creating and driving change, there is now renewed emphasis on those who are reluctant to change. Fullan (1997) argues that with emotional intelligence and empathy, initiators of change can learn a great deal from resisters. He continues:

> The role of enthusiasts has been overestimated, and the value of resisters has been missed. Enthusiasts can be helpful … but not if in the mid to long run they increase the gap between themselves as a small isolated group of reformers and the larger numbers of organisational members; and not if they turn out to be wrong because

> their ideas have not been subjected to critical scrutiny by nay-sayers who have a different point of view. (p. 223)

Champy (1995) writes that a culture that squashes dissent is doomed to stagnate, as disagreement, in any case, cannot be squashed. Trying to manipulate or control change in order to minimise or eliminate resistance is not only exhausting but also futile as it just gets repressed "to emerge later as a pervasive sense of injustice, followed by apathy, resentment and even sabotage" (p. 82). He argues that disagreements and dissatisfaction are often the lead-ins to change, and that resistance and dissent frequently embody good sense. Reconciling positive and negative emotions can release energy for change, and the initiator or leader of change who combines hope and empathy even in the face of seemingly lost causes, has a good chance of breaking through. Resistance is therefore an essential ingredient of progress and resisters and "subversives" within an organisation need to be legitimised. Change leaders should not assume that decisions will or should go their way. Instead, they need to value diverse views and disagreement as fundamental to creative breakthroughs, picking up cues to new ways of thinking, and being tolerant of actors and activities on the margins.

Gunter also supports the idea of resisters and mavericks being important to an organisation undergoing change, even suggesting that these "fringe dwellers" need to be seen as positively as enablers and emancipators, and actively promoted. She comments that organisations should seek to creatively utilise their discordant energy by fostering its political activity, rather than by attempting to overlay or eradicate it by formal structures. When events, crises or challenges arise, the spontaneous and self-organising capacity of subversives and mavericks may become the source of innovation and creativity, producing emergent novelty at the "edge of disorder" (Stacey, 2000). Thus, rather than being assumed to be of only negative value, the collaborative behaviours of resisters, subversives or mavericks who form self-organising groups can contribute positively to the learning and resilience of the organisation. Indeed, in some cases their amplification of new issues and perspectives can be such that they ensure the very survival of the organisation, replacing redundant decision-making procedures with new networks, teams and ideas that can readily respond to changed conditions. These ideas mean that teachers and schools need to have a healthy respect for diversity and conflict, and tolerance for degrees of uncertainty, in times of perceived chaos. However, as Fullan (1999) emphasises, "there is no point celebrating diversity and conflict if you are not also working on connectedness and coherence" (p. 29). This is the key message of "going deeper" with change. Unless there is committed support,

empathy and trust in the ideas, people and partnerships already in the school, the organisation will continue to dwell in chaos rather than be liberated at its creative edge.

Going Wider: Developing "Inside" Interactive Cultures

Gunter (1997) reiterates that one of the key challenges for organisations, including schools, is to learn that contradiction and conflict are very creative. People do not change if they are subject to the control of strong value systems such as stability and consensus. Effective management in a chaotic world, she says, is about being a "bureaucracy buster" and "equilibrium buster" (p. 90). Organisational learning and the creation of new knowledge are central. One of the most influential exponents of the concept of the learning organisation is Senge (1990) who argues that an organisation excels when it knows how to recognise disorder and is able to tap into the commitment and capacity of all its members as learners, not just its leaders. While Senge locates learning as an individual activity, he recognises the potential of profound teamwork to generate the learning needed to stimulate change. This places the emphasis on the capacity of individuals, and also on groups, to organise and respond to disorder in ways that create new knowledge. This sensitivity and responsiveness to local conditions is the "butterfly effect" of chaos theory (Gleick, 1987) which recognises that organisational change resides in each individual in any part of an organisation, but has the potential for impacts that are much wider than the immediate environment.

Self-Organised Communities of Learners

The lesson for schools regarding this aspect of the application of complexity theory is to recognise and tap into the plurality of skills, capacities and "intellectual capital" of all its members. This is important for equality of opportunity for staff, as well as for encouraging spontaneous capacity to organise and respond when events or crises face individuals and groups. This capacity for self-organisation, where fluid groups form and can network with each other while an issue is salient, is crucial (Gunter, 1997). Interactions are based on collaboration rather than collusion with an emphasis on open communication, active listening, and recognition of opportunities for learning. There is capacity for individuals to be self-motivated and self-regulated, and to value themselves as facilitators of action rather than steered, either directly or from a distance, by policy instruments and agencies. As Senge (1990) states "in the traditional organisation, the top thinks and the local acts. In a learning organisation, you have to merge thinking and acting in every individual" (p. 288). Motivation is by intrinsic rewards such as a sense of achievement and feelings of self-worth, rather than by extrinsic rewards such as pay and promotion. Essentially, in these

"communities of practice", it is recognised that team learning exceeds that of individual learners, is more rapid, and can produce extraordinary results (Stacey, 2000).

These ideas about learning in self-organising groups also connect with recent ideas about professional development. This kind of professional learning, where teachers are in charge of their own professional development, is often seen in the context of "lifelong learning" – described by Candy (1997) as learning that is dynamic, progressive and cumulative and which, though perhaps triggered by a specific case or problem, typically evolves beyond it. A feature of such responsive and developmental professional learning is that, while individuals may not have much background with the trigger issue or problem initially, the learning can become quite important to them and may lead to entirely new and unanticipated outcomes.

The value of self-organised, self-directed professional development is also affirmed by (Hall, 1997) who distinguishes between activities that are "staff-centred" and those that are system or school-directed. Hall identifies a number of important characteristics of teacher-centred professional development. Firstly, it meets identified, articulated and individual needs of teachers rather than school or system needs. Secondly, it is largely planned and organised by teachers. Thirdly, it maximises teacher participation. Fourthly, it is assessed by teachers as valuable and meeting their needs. These characteristics contrast starkly with common forms of teacher professional development where the school or system mandates the conditions, terms and content, and where teachers are often passive recipients of professional development training sessions delivered by "experts". A 1995 study of Queensland teachers endorsed teacher-centred approaches to professional development (Queensland Consortium for Professional Development in Education, 1996). This study showed that practicing teachers consider that self-directed professional development is more likely to engage their interests, needs and emotions than mandated or top-down approaches. Consequently, professional development activities are highly valued in schools where teacher-centred professional development is encouraged. This is reflected in the fact that developmental activities occur more regularly; often last longer and are ongoing; participation is generally voluntary with high participation rates; are personally, as well as professionally, developing; and activities are adequately resourced.

Self-directed professional development resonates with organisational learning models that feature chaos/complexity perspectives. It is responsive to local conditions, emotionally engaging, features loose networks of interested individuals, and emphasises learning and change. In contrast, many approaches to school leadership and professional development

approaches that embody strategies, tools and rational cycles for proactively empowering people, may be “an expensive illusion” (Gunter, 1997, p. 92). Leadership from a complexity perspective, she reiterates, is the product of human networks within a context, rather than a product of a role hierarchy and contrived cultural norms. The recent trend towards the “expert manager” in education not only denies teacher professionalism by elevating managerial knowledge and skills, but also cuts off the professional manager from information analysis and interpretation. There cannot be meaningful debate about the quality of teaching and learning, states Gunter, until teachers take control of it and become engaged in investigating their own issues of importance.

This implies, though, that teachers have opportunities to collaborate and communicate effectively. As Binney and Williams (1995) note “it is the result of interaction that things can be seen differently, choices appear, and action is supported” (p. 145). One of the dilemmas for school change, however, lies in the managerial and social organisational structures of many schools which keep teachers apart from each other and from decision-making. The traditional school organisational structure, writes Donohoe (1997) is a box at the top for the principal and a single long horizontal line of boxes below for teachers and other staff, a structure that minimises collective, collegial behaviour on the part of teachers. At the same time, it also maximises two conflicting behaviours. It leads to “bureaucratic, rule-prone direction from the top… and then it creates autonomous teachers, who, behind their classroom doors, can readily ignore much of the top-down direction” (p. 169). Consequently, as many teachers work extensively in isolation, there is greater probability that they will find change more difficult. This is because this kind of organisational structure lacks an infrastructure that provides adequate leadership or enables teachers to work together on school-wide problems. Furthermore, claims Donohoe new forms of school management, such as school-based management and school councils, that purport to be about open communication and decision-making tend to be grafted on to this traditional school organisation and “don’t necessarily break up the horizontal rows of boxes” (p. 161).

Thus, Donohoe affirms the need for schools to create and sustain interactive cultures that provide opportunities for teachers to engage meaningfully with issues, and where they can learn and develop professionally. One strategy for enacting such cultures is through action research, because it opens up issues and practices to scrutiny and reflection, encourages dialogue and supports action and change. Hence, it contributes to individual professional development and also to the collective development of the teaching profession. Moreover, as a change strategy for guiding teachers’ efforts, action research has attributes consistent

with complexity theory and post-modernism (Brennan, 1998). Like Fullan (1999), Gunter (1997), Hargreaves (1997c) and others, who are actively reconceptualising educational change in the light of newer theoretical perspectives, Brennan recognises that there has been an over-emphasis on rationality and linearity in early professional development approaches. She argues that "action research has been very interestingly and helpfully retained as a non-dominant form of professional development and a non-dominant way of working" (p. 43). She affirms that teacher-centred professional development that uses collaborative processes such as action research can make a significant contribution to establishing a learning culture in a school. Through such processes, teachers are encouraged to be energetic, committed and passionate for their work, knowledge creation and actions are rewarded, and innovation and change are celebrated.

Going Even Wider: Developing "Outside" Collaborative Partnerships

However, if schools are to change significantly, such changes need to involve more than teachers' own communities of colleagues. Even though many teachers believe they are already overwhelmed by pressures for change *within* their own schools and classrooms, adding "more breadth" to educational change means extending professional collaboration beyond the school, into the wider community. Hargreaves (1997c) argues that this helps change "go wider" in ways that are purposeful and emotionally engaging, rather than through means that are cosmetic and opportunistic such as marketing campaigns, or bureaucratically superficial, as with some forms of school councils.

The language and concepts of complexity theory are helpful in understanding and actioning ideas about external collaborative partnerships. The construction of multiple meaningful relationships creates synergisms – networks of non-linear relationships where the whole is more than the sum of the components (Parker & Stacey, 1995). Such interactions between large numbers of parts in a non-linear system can create novel forms of relationships (Stacey, 2000). Transferring this concept to a school means making the most of the creative potential in the many links, connections and relationships that exist between a school and its community. Harnessing this "radical potential" means that many more possibilities and options for continuous improvement are created because the school is energised by operating at the "bounds of chaos", even though tensions increase as its "stable equilibrium" is challenged.

Fullan (1999) admits, however, that few schools have reached the stage of "living on the edge of chaos". Most, he argues, are not in the habit of seeking outside connections and even the best-connected schools have only just begun to develop collaborative partnerships.

Close and regular contact with their communities is essential for new opportunities to be taken up and potential to be realised, otherwise too much is missed in a rapidly changing context. The days of schools being "castles in their communities" (p. 11) are over, claims Hargreaves (1997c).

A practical way of facilitating such community coalitions, suggests Epstein (1997) is to create an "action team", comprising teachers, parents and administrators for building partnership programs for schools and their communities. However, like Theobald (1997), she does not see that establishing productive community partnerships is an easy task. It is an incremental process, developed over time, not a situation that happens in one dramatic event. Furthermore, true partnerships are not built around peripheral public relations activities, continues Epstein. She suggests that partnership activities that also improve teaching and learning are more likely to be successful because they integrate with the school's central purpose. Epstein asserts that the action team approach to partnerships can also be helpful in redefining and restructuring staff development. She suggests that it can come to mean "colleagues working together" – teachers *and* parents, to develop, implement, evaluate and continue to improve practices. This means that professional development should become less a "dose of in-service education" than an active form of developing staff (and parents') talents and capacities for the mutual benefit of students. Through such deep and effective collaborative partnerships, continues Fullan (1999), schools are more likely to mobilise technical and political forces for reform and become better able to "learn to make their way in difficult terrain" (p. 45) under the chaotic conditions of complex change.

The External Change Agent

These approaches do not mean, however, that communities of learners will not require outside support. Donohoe (1997) makes a cogent case in support of external change agents assisting schools through the traumas of change. This is not to say that people within the school – principal, teachers, parents, even children – are not also agents of change. However, there is a case for an external agent, "a friend of the school" to assist as a change catalyst. Ideally, says Donohoe this change agent would have experience as a teacher and administrator; have skills in group facilitation; be politically savvy; have a good knowledge of current research and practice in the areas of teaching, and have a personal commitment to school improvement. He continues that the change agent "is both enabling and motivating – providing sanction, protection, capacity, knowledge, resources and the

opportunity to change – combined with a set of expectations and the sensitivity to know when, where, in what direction and how hard to push" (p. 168).

The role of the action researcher fits with this change agent role. As Jensen et al. (1996) point out, the role of the catalyst as a partner with the school is not one just in terms of providing "good" questions, "fuller" explanations or "more adequate visions of development" (p. 43). Rather, they stress that the external agent should be sensitive to "insider" concerns and interests by becoming the concerned "asker" of "rude questions about praxis" or the proposer of "alien" perspectives. As a disturber of equilibrium working closely with principals, teachers and others to build up internal capacity for change, the outside agent can contribute effectively to a school's continuing development.

LEARNING FROM PRACTICE

This literature review has explored recent theories and perspectives about organisational change and complexity, and their relevance to education. I now move to an examination of the literature that discusses what has been, and is being, learned about educational change as schools begin to implement reforms that go deeper and wider. One of the dilemmas is that the use of concepts such as emotional intelligence and chaos/complexity is only beginning to be tested in educational contexts. Hence, there is little substantial evidence, and certainly no significant body of literature based on practice, to affirm their worth. Therefore, it cannot be claimed that pursuing these ideas will automatically lead to successful change in schools or their systems. However, as Fullan (1999) reiterates, there is no doubt that previous reform strategies have failed, and the source of these failures lies in the weakness of the theories of change that have underpinned them. Overall, he unequivocally maintains, they have been far too simplistic or, indeed, absent altogether.

Thus, while it is too early to fully appreciate the implications of working with these new theories and perspectives, more sophisticated reform processes are beginning to be implemented. Furthermore, some consistent messages about complex organisational change in schools are beginning to emerge. For example, in a study of a decade of (mostly) British school effectiveness research, Elliott (1998) parallels the messages of Fullan (2000) and Hargreaves (1997c). He emphasises that schools require reculturing rather than restructuring, and suggests that schools need to proclaim education as a set of highly personal transactions that involve complex considerations of curriculum and pedagogy within very context-bound situations. As this discussion indicates, there is no "quick fix" to be found in the latest models of rational, managerialist planning.

In the light of newly emerging practices that seek to account for ideas about chaos/complexity and a post-modern focus on power relationships, Fullan has recently reworked his earlier ideas about school and educational change. In so doing, he has developed a set of "complex change lessons" (Fullan, 1999). These reconceptualise his earlier "basic change lessons" (Fullan, 1993) for guiding change in schools. These sets of "change lessons" are contrasted in Figure 6.4.[151]

	Basic Change Lessons (1993; 1997)	**Complex Change Lessons (1999)**
Lesson 1	You can't mandate what matters	Moral purpose is complex and problematic
Lesson 2	Change is a journey not a blueprint	Theories of change and theories of education need each other
Lesson 3	Problems are our friends	Conflict and diversity are our friends
Lesson 4	Vision and strategic planning come later	Understand the meaning of operating on the edge of chaos
Lesson 5	Individualism and collectivism must have equal power	Emotional intelligence is anxiety provoking and anxiety containing
Lesson 6	Neither centralisation nor decentralisation works	Collaborative cultures are anxiety provoking and anxiety containing
Lesson 7	Connection with the wider environment is critical for success	Attack incoherence: connectedness and knowledge creation are critical
Lesson 8	Every person is a change agent	There is no single solution: craft your own theories and actions by being a critical consumer

Figure 6.4. Fullan's key attributes of educational change.

As examination of these two sets of statements illustrates, the complex change lessons incorporate understandings about processes of change that have been extended and deepened by the theoretical and empirical advances gained from the application of complexity theory. While acknowledging the continuing validity of the earlier change lessons, Fullan stresses that the later lessons, in providing a deeper and more coherent basis for understanding and acting in complex change situations, are consequently, more valuable. Taken together, he suggests these complex change lessons provide a powerful guide to schools wishing to embark on reform that is founded upon understandings of the dynamics of complexity.

[151] Derived from Fullan's "Basic change lessons" (1993) and the updated "Complex change lessons" (1999).

NEW LESSONS FOR LARGE-SCALE REFORM

So far this discussion has reflected the perspective of the school as a special, but individual, organisational culture. However, educational and social reformers, including those seeking sustainability on a global scale, cannot be satisfied with isolated, small-scale changes in schooling. Rather, the real aim is for large-scale reform. As with change at the school level, however, large-scale reform can no longer be construed as monolithic social restructuring. This form of change fails because such reforms have not altered the "grammar of schooling" (Tyack & Cuban, 1995, p. 5), the set of expected patterns that have historically constructed the idea of a school (Farrell, 2000; Fullan, 1999; Tyack & Cuban, 1995). Instead, reforms become assimilated to previous patterns that are very difficult to change. Successful large-scale, top-down educational reforms have generally been rare and idiosyncratic and have taken far longer than originally anticipated (Farrell, 2000).

Ideas about system-wide transformation need to forgo notions of large-scale mandated reforms. Instead, ideas of complexity and diversity need to be considered. This means looking for, and appreciating, the potential in small-scale reforms. The apparent contradiction is that the answer to large-scale reform lies with small-scale reform. It is argued that, over time, thousands of local changes built from the bottom-up will lead to innovation diffusion that becomes a major change in the overall educational effort. What is advocated is "the development of the local culture in the school and of the school in the local culture" (Jensen et al., 1996 , p. 101). Each culture, inside and outside the school, is different and each school can become a unique cultural centre that reflects culturation experiences into society and vice versa. As Farrell (2000) states, "under this conception, the task of the planner is not to invent and/or implement the innovation or reform across the whole national territory, but, rather, to develop and unleash a capacity to innovate throughout the system" (p. 95).

Fullan suggests that an important aspect of such local capacity building for innovation is the transferability of capabilities, rather than products, across a system. Therefore, creating change is not about appropriating someone else's successful program or policy and transplanting it. To enhance capacity building, suggest Tyack and Cuban (1995) "policies [need to] be treated as hypotheses" (p. 83), and practitioners should create hybrids suited to their own particular context. Instead of being ready-made plans, reform policies are best stated as general aims and principles to be modified in the light of local experience and embodied into practices that vary by school, or even by classroom. Through such devolved approaches, schools and communities can then more easily implement the processes

advocated in the earlier part of this discussion – they can focus on teachers' emotional intelligence, support self-directed professional development, create strong networks between schools and their communities, and foster schools as learning communities.

Systems decentralisation, in tandem with local capacity building for innovation, is also needed. This involves the reduction of large-scale, centralised administrative regulation and the delegation of responsibility for decision-making to schools, thus strengthening their "local" emphasis. Elliott (1998) suggests that a "federal" structure, consisting of a network of schools coordinated through a central agency, which is very much reduced in size, appears to be the emerging model. In this kind of structure, schools are not accountable to the centre in the same way that they are within a bureaucratic system. However, a cautionary note needs to be sounded. Many deregulation reforms, as earlier discussion has indicated, have been strongly criticised for emphasising "economically rational" aspects of reform rather than their educational and cultural potential (Sterling, 2001; Tyack & Cuban, 1995). The narrow focus on simplistic, linear forms of change – rather than a focus on non-linear, complex ones – leads to a well-placed suspicion of many current decentralisation reforms. It would be counterproductive to have schools embracing ideas of diversity and complexity, yet continuing to be driven by mechanistic values emanating from their bureaucracies. New structures that will support networked learning communities are needed for truly transformational, systems-wide educational change.

In summary, creating widespread educational change requires both capacity building at the local school level as well as changes to the multilevel systems of which schools are a part. Only then can small changes resonate in significant ways throughout the system and throughout society. Those committed to new ideas in education need to think and act at both levels – to be reformers inside schools and activists in the infrastructures surrounding schools. As Fullan (1999) indicates, "transferability and large-scale reform urge all of us to pay attention to the big picture. This is not the time for modest goals" (p. 75).

CONCLUDING COMMENTS ABOUT EDUCATIONAL CHANGE

This literature review has discussed school reform and aspects of large-scale educational change. There is growing consensus that past experiences of such change have been failures and that new theories and practices are needed. Both postmodernist perspectives and chaos/complexity theory emphasise the importance of changing the *culture* of an organisation, as significant to creating change overall. The recognition that schools are highly complex and diverse organisations, and hence require change strategies that

recognise such complexity and diversity is essential and must be embedded into new ways of examining and guiding school change. This means that understanding and problematising the power structures and relationships within a school is necessary, and that strategies that help create meaningful professional and collegial relationships amongst teachers need to be developed.

A complexity perspective fosters the view of a school, not as a system that is inherently stable and predictable, but one that is unpredictable and disordered. Hence, commonplace, linear models of organisational change will be unsuccessful in helping schools grapple with the rapidly changing and destabilising social climate in which they operate. Schools need to "go deeper" by paying greater attention to the emotional needs of teachers if they are to become innovators and agents of change. They also need to develop interactive, self-organised learning cultures to foster creativity and capacity "at the edge of chaos". Moreover, schools must "go wider", and connect more significantly with their communities in order to be responsive to local conditions and to harness additional resources and further capacity for change.

Finally, as schools change their internal capacities, structures and relationships, there also needs to be significant decentralisation of bureaucracies to support local creativity and innovation. The signs from new "lessons from practice" and from the small but developing body of research investigating such changes, indicate that both local school change and a devolved bureaucracy are prerequisites for change to become widespread. Overall, these kinds of transformations, that go deeper and wider, than in the past mean that educational change is much more likely to be slow and evolutionary rather than rapid and revolutionary, no matter how much one wishes it were otherwise.

META-ANALYSIS, CRITIQUE AND SYNTHESIS

The first section of this chapter outlined the final stage in the completion of this learnscaping curriculum project. As in Cycles 1 and 2, this involved a narrative report of events, a review of research practices and protocols and articulation of key issues arising during the cycle. The second part of the chapter reviewed and synthesised literature about schools and educational change which became significant to my thinking about the project during the periods of stagnation and final completion of the learnscaping manual. Because the end of this cycle also coincided with the end of the study, I can draw together key ideas and analyses generated over the life of the whole project in this final section. This provides

a meta-analysis and synthesis of the entire action research process. These ideas are further extended in the next, final chapter of this thesis.

A critique of *Learnscapes Alive* is the first part of this meta-analysis. The second part revisits the narratives and analyses of each of the three research cycles. In re-searching for significant and/or recurring comments, themes and threads, new ideas about schools and educational change, about environmental education, and about action research emerge, encapsulated in both text and diagrammatic form. The final section contains suggestions for the future, with options and possibilities for embedding the project further into the fabric of the school and extending its effects beyond the school gates – that is, offering ideas for the project to go deeper and wider.

DESCRIPTION AND CRITIQUE OF THE LEARNSCAPING MANUAL

As has been mentioned in the first part of this chapter, the learnscaping manual – the tangible outcome of this five-year action research project – was finally completed. The outcome was *Learnscapes Alive: A Teachers' Manual for Environmental Education* (Appendix O is the contents page of the finished document). This is a large two-ring binder in three parts (*Learnscapes Alive* curriculum document, Cycle 3, 22/1/02). Section 1 of the document provides the rationale, written as a number of short, general essays entitled:

- Environmental challenges;
- The role of education in educating for sustainability;
- The nature and principles of environmental education;
- Approaches to environmental education;
- Integrated curriculum approaches in environmental education;
- Children and nature;
- Learnscaping as an integrating element for environmental education.

Section 2 of the manual contains background information on the school's environmental education focus and the significant features of its grounds and gardens. It also outlines the history of the Fernwood Learnscaping Project and explains how this project links with other environmental education projects in the school. The learnscaping stories developed in 1997 are included as part of this history, with an explanation of the strategies used to develop these stories, and ideas for extending learning based on them.

Section 3 is the major part of the manual and comprises the learnscaping curriculum. This includes explanatory notes for using the manual, "Tips for Teaching Outdoors", and "The Earth Carers' Code" (Appendix M), a set of statements for reinforcing "environmentally responsible" behaviours in the gardens and grounds. The main part of Section 3, however, contains practical activities created or collated by the teachers during the workshops and writing sessions conducted in 1998. This component includes information sheets and teaching and learning materials gathered from sources such as Greening Australia, the Koala Foundation, the Gould League and other environmentally-focused groups and agencies that publish materials for school and community education.

All these teaching and learning ideas and activities have been categorised into subsections and are organised around each of the learnscape gardens and linked to curriculum content areas. The subsection for the *Line and Shape Garden*, for example, contains activities for a *Maths Trail* while the *Colour and Scent Garden* subsection has a range of language and Arts-related learning activities. Another subsection focuses on the *Aboriginal Food/Use Garden* and provides activities to support teaching and learning in *Studies of Society and Environment*, while the *Growing Garden* contains ways to utilise the school's plant nursery as a curriculum resource and is linked to the *Science* syllabus. Overall, this large and comprehensive document contains an array of ideas, activities and resources for environmental education, developed for and by the teachers at Fernwood State School and tailored to suit their local school environment.

Positive Attributes

This manual provides a wide range of teaching and learning activities and supporting materials to assist the teachers in this school to implement environmental education in their own schoolgrounds. In summary, the manual has the following positive attributes:

- It "belongs" to the school. It contains the ideas and activities contributed by the teachers of this school, who will be the main users of the manual. The materials, covering all year levels, have been developed or selected with the grounds of this school specifically in mind. The photographs used to enhance the text were taken in this schoolyard. These elements add interest and reinforce local ownership.

- The manual is attractive and easy to use with considerable attention given to making it colourful and readable. Overcrowding of the pages with text has been avoided. Activities and information are organised such that materials can be easily extracted, copied and returned to the folder.

- It provides a “plain English”, easy-to-read introduction to aid understanding of the value and importance of environmental education. This rationale was derived largely from the teachers’ own expressed needs and concerns about implementing environmental education into their curriculum.

- The manual includes a wide range of cross-curricular materials that align with the current curriculum priorities of Education Queensland schools. Research has indicated that such alignment should encourage the teachers to undertake outdoor/ environmental activities because the links between the manual and the “core business” of the school are clear, and relevant to teachers’ work.

- The manual seeks to make teaching and learning outdoors easy. As well as providing many ideas for activities, it includes suggestions to help teachers establish and maintain student interest and appropriate group management when working outdoors. This was identified as a real and potential source of stress for many teachers who feared accidents, injuries and increased discipline problems when working outside the classroom.

- Sufficient copies of the manual have been printed so that teachers can access their own copy. This means that the resource is readily available and that each teacher can personalise the manual to suit his or her own classroom needs and interests.

In summary, *Learnscapes Alive* contains a wide range of ideas and suggestions to encourage teachers to better utilise their schoolgrounds for learning. It is an attractive, accessible and meaningful resource designed for, by and with the teachers in this particular primary school.

The Limitations

Nevertheless, alongside these positive attributes are weaknesses that were identified early in the project and which were not remedied through successive action research cycles. Thus, the limitations identified in Cycles 1 and 2 remain as applicable at the end of the project as at the beginning. The limitations of *Learnscapes Alive* can be condensed into the following three points:

- The teaching and learning activities contained in the resource are more likely to be vehicles for learning subject-specific content such as Mathematics or Science or Art (albeit in the outdoors) than to facilitate deep level development of pro-environment values, knowledge and skills.

- The teaching and learning ideas are likely to lead to enjoyable, but rather superficial, environmental learning rather than to promote inquiry, problem solving and collaborative action-taking, the cornerstones of critical pedagogical approaches to environmental education.

- "Green" science dominates the choices of activities included in the resource, with little of the material addressing environmental issues such as waste minimisation, the school's own use of water or energy, or a range of social justice considerations implicit in education for sustainability.

In summary, these "negatives" reflect the lack of a critical environmental education perspective, discussed in detail earlier in this thesis, and recognised by many as central to transformative environmental education.

TOWARDS A NEW UNDERSTANDING OF EDUCATIONAL CHANGE

Regardless of the strengths and shortcomings of the final "product" of this project, a great deal has been learned about educational change through this action research journey. As indicated in chapter 4, I came to the study with some initial assumptions about educational change based on my previous study and experiences. These were that: whole school change is the most successful; democratic ownership, leadership and relationships are vital for guiding and committing participants to change; strong connections are indicated between curriculum development, professional development and educational research; and changes are more likely to be sustained if committed into policy and developmental planning. However, I deepened and broadened these ideas based on the experiences of this action research and the literature encountered as each cycle of the study evolved.

By the end of Cycle 1, I had moved from generalised assumptions about educational change to ideas that reflected my developing understanding of the importance of contextualised knowledge of a specific site and specific social relationships. After Cycle 2, my propositions about educational change revealed a further deepening of the value of collaborative and reflexive interpersonal relationships as a basis for creating change. There was also a growing appreciation of the value of using inclusive processes for professional development, and the importance of generating coherent approaches to curriculum through professional development. Overall, my propositions about educational change at the end of Cycle 2 showed increasing understanding of the complexities involved in creating educational change.

At the end of the study, I had significantly reconceptualised my thoughts about educational change, especially due to insights gained through my explorations of complexity theory, which I encountered rather late in the project. As these final propositions show, I focus less on the dynamics of creating change, though these are still important, and more on articulating "less fuzzy" characteristics of educational change. By this stage in the study, I had re-evaluated the project's processes and its outcome, and recognised that, even though the change was small scale and slow to develop, it had considerable worth as an innovation from which further actions are possible. Figure 6.5 summarizes the development of these propositions, drawing together my initial assumptions about educational change, the guiding research questions related to each of the research cycles and phases, and identifying the propositions that emerged as a result of the investigations into these queries and questions. Overall, this table presents a profile of the research "in action", illustrating its complex and evolutionary nature.

MY NEW LIVING EDUCATIONAL THEORY: IDEAS IN PROGRESS

This profile identifies the key questions and ideas about educational change that developed through the phases and cycles of this action research project. By drawing these elements together, this profile has assisted in the further development of my understandings about the project. Through this mindful appraisal of the project, derived from a specific experience of change, four "less fuzzy" propositions about educational change have emerged. These are that the value of an innovation resides in its local meaning, change comes slowly, even a small change can be significant, and ordinary relationships can be stories of survival. These are not intended to be conclusive statements about the nature of educational change. Instead, they represent my developing living theory about such change and stand as ideas-in-progress that will undoubtedly evolve and deepen into the future.

Proposition 1: *The Value of Innovation Resides in its Local Meaning*

Determining whether a change initiative, such as this project, has failed or succeeded by measuring it against criteria outside the context or against some theoretical principles has little relevance. This initiative was a socially constructed enterprise from start to finish, locally relevant through extended and active collaboration with those at the research site – who approved, discussed, created and debated what was going on. At numerous stages in the process, alternative decisions, directions and choices could have been taken, or different emphases given to particular aspects, personalities or criteria. Regardless, what emerged was a process and outcome that belongs to the setting, signals "where the school is at" and

CYCLE 1 : LAYING THE GROUNDWORK	GUIDING QUESTIONS	EVOLVING THEORY ABOUT EDUCATIONAL CHANGE
Phase 1 Initial impetus & entry to the project	*What do I already know about educational change?*	**Initial Assumptions** • Whole school change is the most successful. • Democratic ownership, leadership and relationships are vital for guiding and committing participants to change. • There are strong connections between curriculum development, professional development & educational research. • Changes are more likely to be sustained if committed into policy and developmental planning.
Phase 2 Finding starting points & common purpose	*What are the characteristics of transformative education and how can education be reoriented for sustainability?* *How can critical environmental education be implemented in a school?* *What the constraints and opportunities for school-based critical environmental education?*	
Phase 3 Negotiating a partnership	*Who are the key people in the project?* *How will we work together?*	
Phase 4 Searching for purpose & identifying first tasks	*What do I need to know about the school and its curriculum practices?* *What is the nature of the curriculum "problem" we are seeking to address?* *How do we address this problem?*	
Phase 5 Initial plans and actions	*What can we learn through practice?*	
Phase 6 Redefining the project	*How do we apply knowledge gained in previous phases of the study to the goal of creating a learnscaping curriculum?* *How can the learnscaping project be reactivated and refocused?*	**Propositions after Cycle 1** • Develop deep contextual understanding • Understand internal relationships & power structures • Develop relationships of trust & mutuality • Understand teachers' theories & dilemmas • Anticipate clarity and confusion • Appreciate importance of action research leadership

Figure 6.5 Guiding questions, initial assumptions and evolving propositions about facilitating educational change.

CYCLE 2: DOWN TO WORK!	GUIDING QUESTIONS	EVOLVING THEORY ABOUT EDUCATIONAL CHANGE
Phase 1 Redefining research & project tasks	*What has gone wrong with the project?* *How can we get the project "back on track"?* *What makes an effective facilitator?* *How can curriculum be developed to maximise support for change and innovation?* *Can I be both an "expert" and a collaborative partner in this project?* *Has the purpose of the project changed?*	
Phase 2 Developing a framework for environmental education	*How can we develop a whole school approach?*	
Phase 3 Creating a framework for professional development in learnscaping	*How can all teachers become involved in the learnscaping project?*	
Phase 4 Implementing professional development - Staff Workshop 1	*How can teachers' knowledge base be developed to support environmental education?*	
Phase 5 Implementing professional development - Staff Workshop 2	*How can teachers' become active developers of environmental education curriculum?*	**Propositions after Cycle 2** • Build social capital to ensure momentum • Use participation to circumvent politics
Phase 6 Teacher curriculum writing continues	*Why is this taking so long?*	• Challenge top-down models of professional development • Promote coherent and critical conceptions of curriculum
CYCLE 3: **THE NEVER ENDING STORY**	**GUIDING QUESTIONS**	**EVOLVING IDEAS ABOUT EDUCATIONAL CHANGE**
Final Phase…. Completing writing tasks, compiling & editing content continues…	*Is slow, small-scale change worth the effort?* *What are the implications of complexity theory for this project?* *How can the project go deeper?*	
Re-emergence of micro-political complications…	*How can the project go wider?*	
Project reflection through thesis writing…		**Characteristics of educational change** • The true value of innovation resides in its local meaning • Change comes slowly
Publishing the document; teacher inservice; completion of thesis.		• A "small win" represents significant change • Ordinary relationships can be stories of survival

Figure 6.5 Guiding questions, initial assumptions and evolving propositions about facilitating educational change, cont'd.

aligns with its current needs. To judge the worth of the project against subjective, contested (and probably unattainable) principles that constitute "quality" in environmental education is unhelpful to generalist teachers doing the best they can, especially given the kinds of constraints and complexities highlighted in this report.

Proposition 2: *Change Comes Slowly*

After five years, this project has only reached the "end of its beginning". According to the model of change developed by Larson (1999), it has reached the end of the mobilisation (preparing to change) phase. There are two phases still to go. These are: implementation (putting the innovation in place) and institutionalisation (routinising the innovation). Much time, effort and commitment has already gone into the project, with much still to be done. Educational change is evolutionary, not revolutionary.

Proposition 3: *A "Small Win" Represents Significant Change*

With this project, what has been achieved is not a whole school environmental education curriculum as originally anticipated but a useful resource, "a concrete, complete … outcome of moderate importance" (Weick cited in Larson, 1999, p. 121). At a glance, the manual might appear quite ordinary, perhaps even pedestrian. However, creating the resource was complex, multidimensional and demanding work, requiring new ideas, new materials, and new ways of working for those involved. It is a small win with the potential for generating further actions in educational, environmental and community change.

Proposition 4: *Ordinary Relationships can be Stories of Survival*

The micro-politics of the school have a powerful influence on change. In this project, interpersonal relationships of support and rivalry played a pivotal role in determining how the innovation developed. At times, the "human factor" offered great encouragement: at other times, it was debilitating. The nexus between personal, work and family life must also be recognised as an important element that impinges on the capacities of researchers and school-based personnel to engage in innovation and change. The time and effort expended on the project had critical opportunity costs in terms of other roles and responsibilities.

NEW CHALLENGES: DEEPENING AND WIDENING THE CAPACITY FOR CHANGE

This five-year project has been in the "mobilisation" phase (Larson, 1999) and has culminated in the development and publication of *Learnscapes Alive*. The challenge now is for the innovation to "go deeper and wider" (Fullan, 1999) to ensure successful implementation and institutionalisation. At least five future actions seem necessary in order to embed and sustain this project. These are: continued teacher professional development;

the strengthening of curriculum links between learnscaping, the school's mission and mandated curriculum outcomes; continual review and updating of the manual; seeking new advocates for learnscaping in the school to initiate and support future development; and making the best use of untapped human resources, namely the children, parents and community members. These possible further actions are expanded upon below.

Future Action 1: Continue professional development for teachers

Further opportunities for teacher professional development are essential for this small win to impact upon current practices in the school. Those teachers involved in earlier stages of the project development need to be re-engaged and recommitted. Additionally, there is a significant number of staff new to the school (about twenty per cent) who have only limited knowledge of the project or of the school's broader environmental education programs. These teachers need to be informed about the project, and their participation encouraged in its school-wide implementation. As Fullan (1993) states "when personal purpose is present in numbers, it provides the power for deeper change" (p. 14). Continuing professional development is an investment in local capacity building and a pivotal component in promoting and sustaining the change.

Future Action 2: Strengthen curriculum links

It will be important to reinforce the legitimacy of learnscaping and environmental education through alignment of the activities in the manual with syllabus documents and other curriculum initiatives. Increased connectedness will also help reduce curriculum overload and fragmentation through increasing curriculum coherence. Similarly, learnscaping and environmental education need to continue to be highly valued by the school. This requires expression through the school's mission, overall school curriculum-planning processes, "marketing" strategies and management decisions. What has been essentially a voluntary innovation, albeit with quite high levels of support, needs to be embedded into the school's "moral purpose" (Fullan, 1999). This is important because, as Larson (1999) notes, voluntary innovations often gradually disappear if adopted in a situation where there is little interest, support or supervisory oversight.

Future Action 3: Regularly review and update the learnscaping manual

Jo has commented that this *Learnscapes Alive* is just "a beginner's edition". As teachers become more comfortable and proficient with learnscaping ideas and practices, with working outdoors with children, and with more critical approaches to environmental education (and education, generally), this manual will require upgrading and updating. The addition of new materials; the reorganisation of activities for better integration with gardens, subject areas,

themes or topics; and the development of more complex learning and assessment activities and inquiries (such as rich tasks) are just some of the ways that the manual might need revision so that it remains relevant.

Future Action 4: Seek new leaders for future phases

The mobilisation phase of this project has taken five years. New leaders are needed to ensure the development of the learnscaping innovation into subsequent phases. The likelihood that the same keen teachers and principal will continue to be available to support the project into the future is unrealistic as staff retire, transfer to other schools, seek promotion, "burn out" or simply lose interest. "New blood" also widens the support base, a critical factor because, generally speaking, more help is required for the implementation and institutionalisation of an innovation than is needed for mobilisation (Larson, 1999).

Future Action 5: Utilise untapped human resources

The inclusion of students' viewpoints, issues and concerns and their greater participation in decision-making should be developed as an essential feature of this learnscaping innovation if their ownership of the project is to become more than rhetorical. Active engagement of children, parents and the broader community in refining and redeveloping this learnscaping resource will also help embed the innovation and keep it meaningful. Such actions will also assist the project to "go wider", furthering school and community change.

This chapter has illustrated the time-consuming and frustrating nature of educational change. At the same time, learning about educational change through practice and through the reading of allied literature has provided a positive experience of change, even if on a small scale. The next and final chapter expands on the possibilities and potential of this and other small wins to become part of larger-scale reform, each contributing towards future ecological sustainability in their small, diffuse but networked ways.

Chapter 7: Small Wins to Large-Scale Change

INTRODUCTION

The purpose of this chapter is to synthesise the many threads of reflection and learning that have been woven into this research experience and have emerged from it. Such reflection and learning has involved re-examining the research objectives; revisiting events, actions and outcomes of the learnscaping project; re-analysing and reflecting further on the research data; and exploring and re-exploring ideas developed from the interplay of the various areas of literature that have been reviewed. This process has helped clarify my own "living educational theory" (Evans, 1995; Whitehead, 1989). The transformations of my own theories and practices have been as much a part of the processes of change as have changes in the theories and practices of others. This living theory also expresses my still emerging and tentative ideas about educational change, environmental education and collaborative action research. In this chapter I also go beyond the details, events and processes of this particular project to offer suggestions for future possibilities and options for the field of environmental education, with the goal of strengthening current activities and encouraging further innovation for both short-term and long-term change.

I begin this process of synthesis by drawing together my learnings from the two central elements of the research – reviews of literature and reflections on practice. In reality, these are not separate and distinct but intertwined and embedded, however, writing about them separately has helped to clarify my thinking. The following summary of literature illustrates the interwoven nature of the three major literature sets explored in this study. It provides a new reading about global environmental challenges, the role of education in the transition towards sustainability, and key ideas about innovation and change in schools. Similarly, the summary of the three cycles in the project has enabled me to articulate what I have learned from this experience about school change. I conclude the chapter by advancing a series of challenges and possibilities for school and educational innovation, environmental education and collaborative action research.

LEARNING FROM THE LITERATURE

The reviews of literature contained in this thesis centred on issues concerned with global environmental challenges, the role of education and environmental education in creating change, and the nature of educational change. These areas were explored across the three cycles of action research and presented in different chapters of this text. Whilst this is an unorthodox method of presenting a literature review, it is an accurate depiction of how the

reviews of literature illuminated the cycles of the study. An unfortunate disadvantage of this way of presenting the literature, however, is the difficulty in explaining the logical links and connections that exist between the sets. The purpose of this section is to reveal the cogent and coherent line of argument that does, in fact, connect them. As a consequence, this meta-synthesis of, and meta-reflection on, the literature has contributed to the specific propositions about educational change, environmental education and action research that have arisen directly from this study, and also to the development of my more personal living educational theory.

REVISITING THE LITERATURE SETS

The first area of literature examined recent reportage on the social and environmental challenges that confront current and future generations. In particular, the impact of diminishing environmental quality on the life choices and chances of children was explored. Arising from these accounts and reviews, the case was made for ecologically sustainable development approaches to become a priority. This review concluded with an examination of literature on the role and importance of transformative education in reorienting society towards more healthy, equitable and balanced ways of living.

The second set of literature was related to Cycle 1 and canvassed the role of education in social change. This included an examination of the constraints upon, and opportunities for education to contribute to sustainability. It also introduced literature founded in critical social and educational theory and socially critical environmental education – the theoretical framework that guided this research project. It also reviewed the relationship of environmental education to the still evolving concept of education for sustainability. Finally, it explored the limitations and potential of environmental education for contributing to educational and social change.

The literature reviewed for Cycle 2 was an extension of topics and issues explored in Cycle 1. The first topic involved an in-depth investigation of integrated curriculum approaches with links made to the differing conceptual frameworks that underpin various integrated approaches. A second topic concerned issues related to the implementation of whole school environmental education. In particular, this examined the constraints associated with implementing environmental education into school settings where specialist subjects prevail. Thirdly, the literature review also explored teacher constraints in environmental education with a focus on the way teachers' theories about education influence their pedagogical choices.

The third literature set related to Cycle 3, and focused on educational innovation and change in schools. It discussed organisational change theory, particularly recent analyses of the impact of chaos theory and postmodernist perspectives on educational change. This review also explored the pivotal role of professional development in assisting teachers to cope with, and create, locally-based educational change. Collaborative, school-based approaches to professional development, using processes such as action research, were identified as having considerable potential to guide and maintain innovation and change because they focus on teachers' needs and offer solutions that empower the school community. The following section weaves these sets of literature together to provide a new "story" about environmental challenges, environmental education and educational and social change for sustainability.

WEAVING THE LITERATURE TOGETHER

As governments around the world strive for higher standards of living for their populations through technological and economic growth, the way humans currently live on Earth is socially and ecologically unsustainable. There is mounting concern about the consequences of development approaches that continue to ignore issues of social cohesion and the marginalisation of natural systems. These include concerns with the degradation of resource systems such as water, air, soils and forests, at a time of increasing world population and concerns about continuing demand for resources. Rapid urbanisation and industrialisation are recent and challenging phenomena with social and environmental consequences. Cities provide economic development and ways of living for large populations, but are also responsible for detaching humans from nature, with many children leading lives which are increasingly indoors and sedentary, rather than connected to nature.

Politicians and many economists pursue policies that presume there are no limits to growth. However, many others believe that the human species is living far beyond its means. For children, who are more vulnerable to harm than adults, and future generations not yet born, the implications of this are potentially severe. The need for fundamental change in the relationships between humans, and between humans and the natural environment, is becoming more urgent. Education is seen as a pivotal means by which society can confront these challenges.

Paradoxically, education is both a vital element in a shift towards sustainability and also a key factor in maintaining the status quo. Schools are increasingly viewed as redundant industrial era organisations that maintain, and even promote, rigid hierarchies with top-down power structures, and unsustainable patterns of living. Education in general, and schooling in

particular, need to be transformed so that they assist in questioning unsustainable practices, and empower citizens to actively contribute to sustainable change. As a transforming education, education for sustainability – a broader concept than environmental education but derived from it – needs to be part of this contribution. However, many environmental education projects in schools have resulted in small-scale change and appear to have had little impact.

Recent educational change theory suggests that school and educational change needs to go deeper and wider than most change experiences have so far attempted, in order to be of greater impact and significance. Central ideas in these new theories are the need to pay greater attention to teachers' emotional frameworks and the ways their relationships at school are built, and the need for broader collaborative relationships between schools and their communities. Furthermore, school change will continue to be limited unless there is understanding of, and accounting for, the diversity amongst schools, due to differing contextual factors. This means recognising that change in schools needs to start on the inside and is more likely to be slow and complicated, leading to small-scale outcomes instead of broad-reaching and dramatic changes. This is because school change means changing the culture of a school. Changes need to be locally-derived using collaborative processes that enhance the personal and educational potential of school community members, but particularly its teachers. This does not, and cannot, happen quickly.

These recent theories about educational change, particularly those drawing on chaos/ complexity theory, also suggest that the small-scale nature of many educational change initiatives should not necessarily be interpreted as failure. Rather, they should be seen as antecedents and contributors to change from which further change, given the right conditions, can be "scaled up" to become quite significant. This means that there needs to be a reconceptualisation of how large-scale change – such as that needed to change schools to teach for sustainability – might actually happen. It is more likely to come from many small internal shifts building upon each other, than from large-scale systemic reform.

Finally, the literature on educational change and educational research strongly suggests that contextually-based, critical inquiry approaches, such as action research, offer potentially effective ways of creating and maintaining changes in schools. These approaches incorporate professional development with critique and practical problem solving of issues and problems relevant to teachers and their particular school contexts. Overall, these approaches seem to offer promise for the development of the transformative practices considered necessary to

help reorient education, and ultimately society, towards sustainable patterns of living into the future.

LEARNING FROM PRACTICE: REVISITING THE PROJECT

The second major area of learning that contributed to the creation of my living educational theory was the practical experiences of participation in this action research project. Here, I recount the major aspects, issues and outcomes of this three-cycle project.

CYCLE 1: GETTING STARTED

Cycle 1 commenced in early 1997 after an initial invitation to assist in the development of a whole school learnscaping curriculum. While it had been anticipated that Cycle 1 would be a time of considerable activity in the development of the curriculum, instead it was largely concerned with clarification of the nature of the research project, in negotiating roles and research approach, in understanding the school context, and in forming relationships with key individuals. Thus, my involvement was more as an observer than as a participant. I was on a strong "learning curve" during this time, increasing my knowledge and gathering resources about school-based environmental education, learnscaping and the conduct of collaborative research. This period of "feeling my way" gave me some "insider" privileges, however. For example, I was able to observe the busy and fragmented nature of teachers' day-to-day work and to appreciate the impact of this on the development of educational initiatives. It also enabled me to comprehend that, although the school had a strong commitment to environmental endeavours, many teachers were uncomfortable working outdoors with children. Furthermore, there was a lack of understanding about environmental education, especially critical approaches. Rather than a theory-practice gap[152] in environmental education, there appeared to be an *absence* of critical theory and practice in environmental education.

Although I was not actively involved in the school's curriculum developments in this first year of the project, I did have some involvement in the 1997 *Earthworm Project.* This had taken learnscaping as a theme, with story-telling as an integrating device to connect children's learning with the various gardens in the school's learnscape circuit. This 1997 *Earthworm Project* provided a "first run" in developing a curriculum based on the school's new landscaping.

[152] *Environmental Education Research* devotes the August 2002 edition to exploring issues concerned with the "theory-practice" gap. A range of perspectives and viewpoints are expressed by a variety of authors both on the construction of "the gap" and how it could be addressed.

Cycle 1 was also a period of considerable evaluation and reflection on past and current environmental education activities, and on gauging teacher perspectives in relation to these. This was achieved through observation, interviews, and on-going reflections in my researcher's journal. Visits to the school became opportunities to establish and consolidate relationships and to further clarify the school's intentions regarding the learnscaping curriculum project. However, with end-of-year activities taking time and energy away from the learnscaping project, inertia set in and the project made little progress.

CYCLE 2: DOWN TO WORK

Cycle 2 lasted for the next two years, with most of the action of this action research project occurring in the first twelve months. In order to restart the project, I took a determined leadership position and proposed an environmental education policy framework and strategy as a way of rebuilding momentum. While not ratified, these proposals for developing a whole school approach to environmental education did, however, provide a strong basis for discussion. This discussion saw the evolution of an intensive action phase that involved two professional development workshops with the whole staff. These were followed by curriculum writing sessions in which small groups of teachers worked together to develop curriculum materials connecting the gardens with curriculum content area. This resulted in, for example, a Maths Trail for the *Shape Garden*, a set of ideas and strategies for growing seedlings in the *Growing Garden* (the Plant Nursery) and activities that promoted appreciation of Indigenous technologies and bush tucker for the *Aboriginal Food/Use Garden*.

At the end of the first year of this cycle, the learnscaping curriculum had taken significant shape and had generated a high degree of commitment and interest amongst the staff. As a researcher-facilitator, I reflected upon the complexities of implementing professional development to support teachers' collaboration and ownership of the project, while also seeking to increase their knowledge and skills in environmental education. I also contemplated the significance of incoherent curriculum frameworks for teachers as a barrier to curriculum development, as this had emerged as an issue in bringing about curriculum change. The ever-present problem of life in the "busy kitchen" of the school also impinged upon progress in the project. When combined with the lengthy Christmas holiday break, this again slowed the momentum of the project. This loss of impetus continued well into 1999. Eventually, the teachers' writing tasks were completed. I finished the rationale that I had volunteered to write, and Jo worked on compiling and editing the materials for publication. In the latter phase of this cycle, my role became mainly that of a motivator, encouraging the

completion of the learnscaping manual so that the teachers could begin to implement it in 2000.

CYCLE 3: THE NEVER ENDING STORY

Unfortunately, the target date for implementation passed by, and so began another two-year period of setting revised completion dates, and watching these pass. The "stop and start" nature of the project continued to be a source of frustration, but also one of deepening appreciation of the complexities of implementing change in schools.

In this final cycle, my role became primarily that of listener, supporter and motivator, with the aim to keeping the project "alive" while interpersonal conflicts in the school impacted heavily upon some participants. Several times I thought the project had finally foundered, never to be resurrected, as a result of these difficulties. However, the learnscaping manual was finally completed at the end of 2001. A staff induction session was conducted at the beginning of the 2002 school year to provide teachers with an overview of the manual and to stimulate interest in its use. Rather than instigating a large-scale change, completion of the project constitutes a "small win" – a successful, small-scale change with the potential for guiding and inspiring further change in the future.

MY LIVING THEORY: THEORISING ABOUT EDUCATIONAL CHANGE

In this section I go beyond discussion of the project itself to place what I have learnt into the larger context of school and educational change. It is not my intention, however, to make broad generalisations about school change and innovation on the basis of this one project, or to propose any generic solutions to the problems and issues of creating change in education contexts. Nevertheless, my reflections on this project add support to findings articulated by others in the wider literature on school change and innovation and hence, I believe, have some resonance both within and beyond this particular school setting.

FOUR CHARACTERISTICS OF EDUCATIONAL CHANGE

Four key characteristics of educational change have developed from my practical and theoretical explorations in this action research project. These are that change is evolutionary not revolutionary, is complex, comes from ordinary people doing extraordinary things, and is fragile. Additionally, I have drawn three interim conclusions about the processes of educational innovation based on my reflections and experiences in this study. These are that

small changes are "beautiful",[153] small changes may create leverage for large-scale transformation, and "scaling up" of innovations requires deep and meaningful professional and community engagement. These key characteristics of change and my interim conclusions about change processes are now discussed.

Characteristic 1: *Change is Evolutionary not Revolutionary*

Schools and teachers are always enacting change. However, these are usually in routine, fairly unnoticed ways, not in dramatic and heroic ways. Typically, change is incremental and evolutionary, not revolutionary. Thus, the requirement for cultural shifts is demanded for the development of collaborative learning communities, cannot realistically occur in the short-term. The transformation of the many "small wins" of school and educational reform into the large-scale societal changes necessary for sustainability will require even longer and stronger cultural change. Patience is a necessary virtue as teachers, environmental educators, and other social reformers engage in localised change, and then seek to fuse these together into large-scale transformation.

Characteristic 2: *Change is Complex*

Rather than being monolithic organisations, schools are really a composite of many different parts (people, buildings, teams, beliefs, values). Compounding this diversity are the complex processes of whole school curriculum development (Nias et al., 1992). Larson (1999) refers to school change as "arational", in that it is non-systematic, non serialised planning and implementation, not sequential or rational in the linear sense. It is often unpredictable and not well understood. Change is affected by emotions and intuition, and by ambiguous and unpredictable workplace phenomena, as much as by more obvious factors. Some triggers for change are opportunistic and improvised, rather than clearly apparent. Typically, teachers are dealing with several concerns that demand their attention at the same time. I would suggest that environmental educators take too optimistic, or too naive, a view of the complexities and inherent difficulties of whole school curriculum development when emphasising the need for educational change.

Characteristic 3: *Change comes from Ordinariness*

There are no "heroes" in curriculum change in a school. While someone has to take a leadership role, initiatives happen through the passions and generosity of ordinary people working competently with their colleagues to effect changes. These changes involve the slow, halting and difficult process of persuading some teachers to change their educational

[153] This expression is derived from Schumaker's 1973 work, *Small is beautiful: Economics as if people mattered.*

beliefs and professional values (Nias et al., 1992, p. 246), to "unlearn" and relearn new approaches and strategies. This can be full of tension, ambiguity and uncertainty. Collegiality can be threatened and, as this project has shown, can become lessons in personal survival. Ball (1987) suggests that innovations, being rarely neutral, tend to enhance the position of certain groups and individuals and disadvantage the position of others. Against these barriers, and perhaps even because of them, ordinary, competent teachers can, and do, make change happen.

Characteristic 4: *Change is Fragile*

The idea of large-scale, systemic and revolutionary change – for example, whole school, whole system, or whole world – is illusory. Even though it is a noble ideal, holding to this will lead to continual disappointment. In truth, educational change is hard work, forged painfully and slowly. As the experience at Fernwood has shown, even with apparently favourable preconditions for environmental education, progressing this whole school curriculum innovation has been slow, and at times tedious and frustrating. Several times throughout the life of the project I thought it would be abandoned, such was the fragility of the process. Even after five years, it is a fragile success that could be swept away by new priorities and staff changes. Adelman and Walking-Eagle (1997) comment that even institutionalised reform efforts require vigilance to ensure their continued success and that reform and innovation must be reclaimed year-to-year, and sometimes month-to-month, to prevent slippage into old and familiar patterns.

THREE INTERIM CONCLUSIONS ABOUT CHANGE PROCESSES

In relation to the processes of educational change, I make the following interim conclusions based on my reflections and participation in this action research. These are that:

Interim Conclusion 1: *"Small is Beautiful"*

Overall, local, small-scale changes need to be re-interpreted, not as reform failures, but as important accomplishments with the potential for "showing the way" to ongoing, large-scale reform. Evidence from the research literature, combined with the experiences of this research project, suggest that slow, difficult, ordinary, small-scale change is the most likely outcome of educational change initiatives. Therefore, rather than expecting the large-scale, revolutionary changes that we might wish for, instead we need to embrace the notion that small-scale change has real transformational value. We need to appreciate small-scale approaches as important and realistic alternatives to educational and social improvement. As a consequence, small wins should be celebrated as successes.

Interim Conclusion 2: *"Small Wins" Create Leverage for Large-Scale Transformation*

Complexity theory suggests that the "small win" change strategy is a key to adaptability and continuous renewal within an organisation (Larson, 1999). It is a strategy that can work now, when we cannot wait for large-scale systemic change to happen. However, it also offers leverage beyond the immediate school context (Fullan, 1999). Small wins can set in motion a process for continued small wins – a process that strengthens organisational capacity and the ability to solve larger-scale problems (Larson, 1999, p. xxiii). That small-scale change can be the route to more substantial organisational improvement is explained by appreciating that, at this small-scale level, success is often more tangible and more personal and therefore more meaningful. As both Fullan (1999) and Hargreaves (1997c) comment, provided the changes go deep enough in terms of large numbers of employees making such changes in purposeful directions, small-scale changes can be potent as springboards for deeper and wider organisational change and renewal.

While currently, there is some ambivalence in the educational change literature as to the potential of "the butterfly effect" of small changes having the capacity to address issues of large-scale systemic change, there is, however, growing support. Fullan, for example, was quite unsure about the value of small-scale, local change in 1991:

> Perhaps more has not been done because innovations at [the school] level appear not to cause real change; they often do not involve basic alterations … and such change may not make much of a difference. (p. 71)

In his most recent works, however, Fullan has been converted to the virtues of small-scale change, and now sees these as necessary levers for "going to scale". Other proponents of the efficacy of the small win include Senge (1990) whose research in the area of the "learning organisation" shows that small, well-focused actions can sometimes produce significant enduring improvements. Kouzes and Posner (1995) also comment that small wins form the basis for a consistent pattern of winning "that attracts people who want to be allied with a successful venture" (p. 248).

Larson (1999) points out, however, that more research is needed at this small-scale level of change. Nevertheless, he enthusiastically seeks to promote the idea that small wins set in motion further processes for continued small wins, that themselves strengthen organisational capacity and the ability to solve larger scale problems. What is important is to resist the mistake of turning inwards which, as Fullan (1999, p. 66) comments, is a "good strategy for

small-scale innovation but fatal for larger-scale impact". What is needed for the transferability of small-scale change to large-scale reform is to foster what was important for the small-scale innovation, but increase the amount and variety of interactions.

"Scaling up" also implies that it is the flow of *capabilities* rather than products that is essential. While at first glance it might seem desirable, for example, that another school picks up the learnscaping manual and adopts it in their own setting, this adoption is unlikely to lead to any real change in the new setting. The trap is that "ideas acquired with ease are discarded with ease" (Bryk et al. cited in Fullan, 1999, p. 64). There is likely to be little capacity-building as the adopted program will not have real relevance to the new context; the rich source of knowledge created from the original experience of "doing" the project has not been effected in the new setting; and the interpersonal "glue" of working with peers in collaborative relationships has not taken place. "No need to reinvent the wheel" is a common saying often applied to situations where a "good" resource becomes available. However, in the case of transferring innovation, there *is* a need to "reinvent the wheel", with the new wheel most likely looking quite different to the original. It is learning the process of making the new wheel that is the benefit of replication, not the wheel itself. As Fullan (1999) states:

> Going to scale does not mean the spread of ad hoc proven programs; it means the capacity of the system (local capacity and external infrastructure in combination) to manage and integrate the complexity of innovations and choices that abound. Going to scale does not mean getting the latest program in place (although this can be valuable in a narrow, temporary sense), but rather it means developing the capacity of the multilevel system to manage complex change on a continuous basis. (p. 74)

Interim Conclusion 3: *"Scaling Up" Requires Professional and Community Engagement*

It is through engaging with systems and infrastructures beyond the local level, that large-scale reform and transferability is likely to happen. Larson (1999) and others propose a number of "levers for improvement" that can aid this "scaling up" so that an innovation is extended beyond the original work, and might encourage teachers, schools and communities to convert their small wins to large-scale systems transformation. The most pertinent suggestions related to this study include:

- Forums and research seminars that enable teachers and others to share ideas and experiences, and to discuss research in non-threatening ways. New norms of collegiality, collaboration and teamwork can be positive spin-offs. Teacher-researchers who study their teaching practices, but who are also committed to sharing their ideas and experiences in a range of forums are crucial (Larson, 1999; Adelman

& Walking-Eagle, 1997). The online environment of discussion lists, web forums and other internet technologies has considerable potential to facilitate this kind of learning and sharing.

- "Laboratory schools" to encourage incremental reform through carefully designed experiments and support. These become "lighthouse" schools for others seeking reform. This status, however, is predicated on the idea that teachers are willing to reach out to the wider educational community and share what they are learning.

- Establishing "mosaics" of small-scale innovation where a set of changes is seen as fitting together in a logical, coherent pattern. In the case of Fernwood State School, this mosaic includes the numerous environmental projects that preceded the learnscaping curriculum project, the project itself, and the implementation and institutionalisation of learnscaping in the school. This is a series of linked, small wins building a foundation of activity, with each win preserving gains and making it harder to return to pre-existing conditions, while providing information and capacity that facilitates further learning and adaptation.

- Innovation inventories and catalogues which identify the numerous small-scale changes not generally visible even to immediate peers, let alone administrators. What teachers might see as minor or trivial accomplishments may actually be small wins of real importance to others. While large-scale problems may seem impenetrable, small-scale, incremental changes are both achievable and rewarding. As Adelman and Walking-Eagle (1997) comment, these strategies provide opportunities for "selling" an innovation, a vital process for implementation. This "exposure" of small wins also helps teachers to see patterns and to construct mosaics of innovation, which encourage further experimentation and change.

- Teacher networks engage school-based educators in directing their own learning. Through networks, teachers can sidestep the limitations of institutional roles, hierarchies and locations, while encouraging collaboration with a broad range of people (Leiberman & Grolnick, 1997). Participants have opportunities to grow in a professional community that focuses on their development needs. Networks provide safe environments for sharing about innovations, while offering support, resources, and solutions to teachers' issues and dilemmas.

These suggestions are aimed at capacity-building *beyond* the original innovation, and as with creating change and innovation *within* a particular context, also take time. A mid- to long-term perspective is needed to effect the large-scale changes, of which each of these is just a small part. At first this may not seem to be a satisfactory proposition to educational reformers keen for rapid and substantial evidence of change, nevertheless it is the reality. Optimistically, however, one could expect that at least some of the myriad small-scale changes and innovations that are currently happening in schools will set the foundations for the large-scale transformations that are needed.

IMPLICATIONS FOR ENVIRONMENTAL EDUCATION

The experience of this learnscaping project has revealed both practically and theoretically, that educational change is more likely to be slow, difficult, ordinary and fragile, rather than revolutionary, robust and sweeping. This has implications for the field of environmental education. I address these in two ways: implications for how environmental education is theorised, and also for the practice of environmental education in schools. Together, these represent new developments in my "living theory" about environmental education.

Implications for Environmental Education Theory

This study has explored and been informed by the assumptions and theoretical ideals of the critical theory. These have provided a framework that has shaped and guided my research practices. It had been my expectation that this study would be conducted wholly within a critical perspective. The central theoretical challenge was to try to "live out" a critical approach through consistent application of critical environmental education research practice. This challenge was built upon my background in critical theory, critical environmental education and previous experience with participatory action research.

As the research project progressed, however, both the practical experiences of conducting the research and exposure to a literature base wider than critical theory caused me to rethink this reliance upon critical perspectives. Despite high expectations and the best intentions, this study has not been a showcase of critical research or of critical environmental education in practice. The diversity and complexity of the school context; the enmeshing of multiple roles and relationships; the incomplete knowledge base of teachers about environmental issues and environmental education; the difficulties of working whole school change; change fatigue in teachers; and the continued pressures of a work/ life/ research dynamic upon my personal reserves, all conspired to limit the project, as measured against characteristics and assumptions of critical environmental education.

Indeed, this environmental education project, like so many others before it, appeared destined to join the long line of critical environmental education "failures", so often discussed in the research literature. It seemed that this project provided confirmation of the hegemonic nature of social, political and educational organisations and structures that conspire to prevent, or limit, the transformations necessary for sustainability. At best, it seemed that this research project could add just a little more to the literature on how not to conduct environmental education in a school.

However, as the project continued, I had cause to question this original analysis. New theoretical perspectives are emerging that are helping to reshape thinking about social and educational change, and which have implications for environmental education. These influences – particularly complexity theory and, to a lesser degree, postmodernist theory – have impacted upon my own theory-making and have consequently facilitated a re-evaluation of the nature and potential of this learnscaping project.

In chapter 3, I alluded to criticisms that postmodernists have levelled at critical theorists. Postmodernism raises compelling questions regarding emancipatory efforts with the politics of liberation being seen as fundamentally tied up with the power politics of racism, patriarchy, sexism, class and language. Rather than a quality that can be created systemically, postmodernists suggest that liberation (and denial of liberty) is constantly produced anew, and must be continually deconstructed and reconstructed. Postmodernism shifts the focus from the search for formal structures and universal values to be changed or rebuilt at a meta level, to understanding our own shifting constructions of knowledge and power in multiple contexts. Postmodernists ask for much greater reciprocity, collaboration and inclusivity in the practices of (environmental) education. As Lather (1991) comments:

> Context and meaning in everyday life are posited as co-constructions, multiple, complex, open, changing, neither pre-given or explainable by large causal theories, but made and remade across a multiplicity of minor scattered practices. (p. 42)

Postmodern social theory also gives attention to the social construction of knowledge that creates "agents". Agency is re-conceptualised within the context of a fluid, changeable social setting, put into motion via the interactions of a plurality of multiply-sited, diffused agents who create "always there and always fragile systems" (Bauman cited in Lather, 1991, p. 42).

Central to a postmodernist perspective in education is that the voices and life experiences of teachers be recognised and respected in research enterprise. This was certainly the intention of this research project, where conditions were deliberately created for teachers to become

engaged in the project design, and in the development of curriculum outcomes. Opportunities were created for them to dialogue with each other and to reflect upon their experiences of these collaborations. Nevertheless, and despite best intentions, this research is largely built upon my "voice", my personal interpretations of experiences and is overly, my construction. While seeking to do otherwise, it continues the reification of the academic researcher as "expert" while objectifying (marginalising) the teachers as research subjects.

These dilemmas, paradoxes and contradictions have made me realise that "doing emancipatory research" is remarkably difficult. Even though guided by critical theory, notions of emancipation, and postmodernist calls for the inclusion of multiple "voices", I have not been able to eliminate positivist (modernist) research practices. Perhaps if I had had greater exposure to postmodernist perspectives at the beginning of the research process, I might have been able to construct the research enterprise differently. I might have used alternative strategies and processes that more overtly challenged the power relationships and discourses of authority that, while I was not always aware of them, were nevertheless embedded into the situation being investigated.

By helping me to become more critical and self-aware, postmodernist theory has assisted in challenging my own theories of, and practices in, environmental education and environmental education research. However, my introduction to complexity theory during this research undertaking has contributed even more significantly. Indeed, engagement with this theory has so significantly altered my thinking about the learnscaping project that I now celebrate it as a small win with much potential, rather than proclaiming it a "critical" failure, as I was initially inclined to do. This change of perspective has resulted because complexity theory has provided a powerful way of conceptualising the continuing failures and futility of large-scale structural reform. It also acknowledges the value and importance of the many small-scale innovations that are occurring in schools, and that are potentially the forerunners to large-scale changes that result from the cascading upwards of the many small wins working together.

This study has confirmed what many intuit about educational change – that it is most likely to be slow, difficult, tense, ordinary and small-scale; rather than rapid, revolutionary and broad. Consequently, I believe a new message needs to go out to the many environmental education practitioners and professionals who are seeking to engage in educational and social change. It is a message of hope and support for their small-scale efforts, rather than the often negative and critical responses about such results that emanate from many in the environmental education field. While we may feel disappointment and frustration about the

pace and scale of change when we so passionately want it to be otherwise, I believe we need to alter our theories about the nature of educational change itself.

In summary, the field of environmental education needs to expand its theory bases and models of work-in-action. Critical theory has provided an orientation that has served the field well, and has given environmental educators useful tools for thinking about and explaining change, and resistance to change. However, there is a danger of evangelising the virtues of critical theory and about the catalytic role of the emancipatory action researcher, while ignoring criticisms of these constructs (Webb, 1996). There is also the danger that existing philosophical and educational theories and frameworks might become entrenched, even "ghettoised" in environmental education, thus acting as new hegemonies in a world where theories and actions continue to change. Engagements with new and emerging theories and philosophies, such as post-modernism and complexity theory, have the potential to act as new and enriching sources of understanding for environmental education. They can also open up new discourses that enrich contestation within the field, as well as enabling environmental education to contribute more broadly to new debates about educational and social change. I believe environmental education can continue to be a cutting-edge transformative education, provided it is also open to transformation.

Implications for Environmental Education Practice

In this section, I present my ideas-in-progress about the broad implications for environmental education practice of a re-theorised environmental education, drawing on postmodernist and complexity perspectives, and the "lived experience" of creating environmental education curriculum in this study. While derived from a specific context, these ideas may have resonance with other researchers and practitioners who have attempted, or are attempting, to bring about change in their own educational settings. Seven key implications are identified. These are: interrogate the silences, give value to small-scale changes; develop understanding of specific contexts; engage in teacher professional development; create pedagogical learning within a culture of collaboration; make links, networks and opportunities for environmental education; and create a culture of positiveness amongst environmental educators.

Implication 1: *Interrogate the Silences*

Gough (2000) and others such as (Barron, 1995), (O'Riley, 2000), and Payne (1999) advocate for environmental educators to recognise and explicitly address issues of race, ethnicity, gender, class difference and language in our work as environmental education researchers and practitioners. Power differentials amongst participants in curriculum

deliberations need to be overtly addressed to enable participation and empowerment. This is especially so if some participants are privileged while others are disempowered or disabled by overt or covert practices of sexism, racism or "othering". Greater use needs to be made of narrative and textual analysis and deconstruction in the wide range of curriculum activities – including the development of curriculum frameworks, resource and text development, assessment models, course structures – and in the processes of deliberation and decision-making.

Implication 2: ***Give Value to Small-Scale Change***

This research has shown that, while our hopes and desires for change might be of a grand scale, achievements are likely to be much smaller. Like many practitioner-researchers in the field of environmental education, I started in this change project with the hope for a more significant outcome than what was eventually delivered. Complexity theory informs us that at some (indefinable) critical point, however, small changes become magnified and cascade upwards through the system. Furthermore, these critical points are everywhere. From many, small, ordinary beginnings, come rich, unpredictable (chaotic) outcomes (Gleick, 1987). Larson (1999, p. 166) concludes that there is "no magic in school change"; no special rules about innovation and change.

This applies to environmental education as much as it does at the broadest level of educational change. Education for sustainability will happen (and is happening) incrementally by evolutionary processes, and requires the support and hard work of all who have an investment in the present, and in the future of children, society and the planet. As Fullan (1999) concludes:

> Those engaged in educational reform are those engaged in societal development… It is time to return to large-scale reform with even more ambitious goals than we had in the 1960s, armed with the sophisticated knowledge that we can turn complexity's own hidden power to our advantage. (p. 84)

Environmental educators need to "think big and succeed small". For environmental education practice, this means that many small-scale, self-organised, context-specific, moderately successful environmental education projects need to be engaged in, and supported – where enthusiasm is high and some change is likely. Seeking to create change mainly through large-scale, systems-driven reform, whilst a seemingly logical imperative, is much less likely to lead to the changes that environmental educators hope for.

Implication 3: ***Understand the Contextualised Nature of Teachers' Work and Concerns***

Constraints on teachers' engagement with environmental education can be summarised into three areas – pedagogical, theoretical and social. Of the first, there is a range of pedagogical factors identified in this study that act to limit what teachers do environmentally. These include a general lack of awareness and knowledge about the environment and environmental education amongst teachers. While there may be one teacher who is considered the "environment expert" in a school, this concentrates, rather than expands, the school's knowledge, resources and decision-making about environmental matters. There is also a lack of site-specific knowledge about environmental topics, such as the names of plants in the school gardens and their features/ purposes, or the identification of local weeds. These factors undermine teachers' confidence for working outdoors.

Another related teaching concern is the perception of environmental education as predominantly associated with science, when many primary teachers have little confidence or interest in science education. As a result, environmental education is both challenging and uninteresting for many teachers. Ways of working with teachers need to be generated that tap into their preferences for non-science learning areas as well as their personal concerns about the environment. There are also major concerns for teachers about managing students' behaviours outdoors. Worries about being unable to control unruly behaviours and the fear of litigation arising from accidents act to limit the amount of "outside" teaching that is undertaken. Indoor deskwork is seen as a safer and less bothersome alternative.

The second area that needs to be understood about teachers' work and concerns, relates to issues of educational and pedagogical theory. There is a plethora of curriculum models and approaches operating within a school, and even within the repertoire of an individual teacher. Examples include integrated curriculum approaches (used particularly in early childhood), discipline-based models (more common in primary and secondary classrooms), student-centred approaches, developmentally appropriate curriculum, literature-based curriculum, multi-age curriculum, multiple intelligences approaches, inquiry-based pedagogy, constructivist learning approaches, inclusive curriculum, outcomes-based education, and authentic curriculum approaches. Some of these approaches are complementary while others appear incompatible. Many of these models have developmental psychology as underpinning theory, while more recent curriculum approaches have emerged/ are emerging from social/ cultural theory and critical theory. Consequently, I believe there is a lack of curriculum coherence for many teachers, arising from a lack of theory about education and educational change. Many teachers have not heard of critical theory, let alone postmodernism or complexity theory, and consequently have little

knowledge of teaching and learning strategies and approaches derived from these frameworks. This reflects both the age of the teaching workforce – the average Queensland primary school teacher completed initial teacher education about 25 years ago, according to Education Queensland (2000) – and the limited upgrading of teachers' theoretical knowledge about teaching over the years.

The third area identified in this study as a constraint on teachers' capacities to engage in educational innovation, such as environmental education, concerns the power of micro-politics as an impediment to change. What some theorists may claim to be hegemonic resistance to change may sometimes be much more benign. At the micro-level of a setting or context, there is ignorance, lack of interest, busy-ness, or simply lack of good will towards another teacher and their ideas. Environmental educators need to turn more attention, at the micro-level, to understanding these very human, personal and inter-personal barriers that limit the capacity for change and innovation. Fullan's (1999) call to pay greater attention to the development of "emotional intelligence" and moral purpose seeks to address this issue, and is as relevant to environmental education as it is to education generally. Overall, curriculum developers in environmental education need to develop a deeper appreciation of the practical, theoretical and social factors that affect teachers' ways of working. While the specific elements will vary from setting to setting, understanding is needed of contextual factors as they impinge upon teachers' ideas, knowledge and practices, their confidence and interest, sensitivities and relationships. Without this understanding, the task of developing environmentally-aware teachers who are committed to environmental education will continue to be a difficult task.

Implication 4: ***Engage in Teacher Professional Development***

All the issues explored above point to the need for investments in teacher professional development. Luke (2000) refers to professional development as the "social capital of teachers". It also equates with the idea of "patient capital", those research and development investments needed for the medium- and long-term to create innovation and change. In Queensland, there has been little professional development infrastructure in state schools since 1993, although this has recently begun to change.[154] Professional development has been fragmented, engaged in at the discretion of the school principal or individual teachers following their interests. Recognition of how teachers in general have been "deskilled" in recent years (Apple, 2001) is necessary. The plethora of "training packages", often

[154] Education Queensland has recently funded statewide professional development in "productive pedagogies" aimed at improving intellectual rigour and relevance of learning through changing teachers' practices.

developed by multinational corporations and other agencies "pushing a product", has added to the fragmented nature of professional development. I believe this has contributed to the lack of curriculum coherence referred to in the previous section and identified as a significant issue for teachers in the Queensland School Reform Longitudinal Study (Luke, Ladwig, Lingard, Hayes, & Mills, 1998). There is also a need for reinvestment in professional development aimed at the re-professionalisation of teachers with a major focus of issues of pedagogy. Environmental educators need to be part of this process, as designers, deliverers, and collaborators in professional development, to ensure that environmental perspectives are incorporated into new professional development initiatives.

Implication 5: ***Create Pedagogical Learning within a Collaborative Culture***

This study has shown, however, that the kind of professional development that is provided is also important in creating change in current practices. The moderately successful approach which led to the "small win" of this study, was one which directly linked teachers' learning about teaching and learning with their own needs and purposes (the development of a learnscaping curriculum). It also linked to systemic educational needs and goals (the need to teach *Studies of Society and Environment*), and with concerns about the "big issue" of ecological sustainability.

The process that was developed in this study, which jointly addressed professional development and curriculum development, was one that valued teachers' existing expertise, knowledge and interests and provided them with choices about participation. It encouraged then to choose with whom, and on what tasks they wanted to collaborate. Equally importantly, teachers were given time to engage in the professional/curriculum development tasks within their existing daily schedules. These activities were not add-ons at the end of a busy teaching day.

Finally, the development of a collaborative culture for curriculum development also appeared to positively reinforce the social and professional learning. It would seem that participatory processes offer alternative and more effective ways of conducting professional development, compared to the usual "preach and teach" methods often used with teachers.

Implication 6: ***Make Links, Networks and Opportunities for Environmental Education***

The development of a multiplicity of environmental education endeavours across the nation, and across the world, should be encouraged. This is regardless of the qualifications and training of the participants, whether goals are ambitious or moderate, or outcomes fully attained or circumscribed. In the Queensland educational context, for example, the first real

opportunities, on a large-scale, for environmental education to be embedded in curriculum and organisational changes in schools are just beginning to emerge. *Studies of Society and Environment* now provides a legitimate place for environmental education, finally bringing it into the curriculum mainstream. The *New Basics* curriculum framework, in trial in some Queensland schools will, I believe, provide further scope for embedding environmental education into curriculum developments.

Another opportunity for further development of environmental education may lie with school-based management where there is an onus on individual schools to develop and enhance their physical and human "assets". This means that schoolgrounds in particular, are beginning to be viewed as resources requiring protection, maintenance and development, rather than simply playgrounds for student use. As has already been recognised by Fernwood State School, school communities are beginning to appreciate that linking their grounds development with curriculum development enhances both the asset base of the school, and the opportunities for learning. In addition, with the growing demand for school differentiation and marketing, a focus on environmental quality and environmental education is helping some schools to distinguish themselves from their "competitors".

Regardless of whether one accepts the "economic rationalist" underpinnings that have largely driven the introduction of these kinds of opportunities, it is important that environmental educators come "up to speed" with these systems-wide changes. There needs to be linkage, connection and capitalisation upon the possibilities currently being created, to introduce and develop environmental education to new audiences and in new settings. Each new opportunity has potential for also developing environmental agency, action and learning. While the "butterfly effect" promises magnification of the (small) achievements beyond their initial impacts, the urgency of the environmental challenges confronting humanity means that we must help speed up the responsiveness of schools to these challenges, by making the most of even the most unlikely openings.

Environmental educators need also to become lobbyists and advocates beyond our own immediate circles of influence, using formal and informal networking to create learning communities for innovation and collaboration in environmental education across many contexts. We need to become leaders in "going deeper and wider", helping to harness individual teacher's concerns for the environment into broad-based curriculum action in schools. We also need to assist in the widespread dissemination of ideas, knowledge and experiences, beyond individual schools, so that the butterfly effect can then intensify and magnify the changes into widespread actions for sustainability.

Implication 7: ***Create a Positive, Supportive Culture among Environmental Educators***

As well as actively building capacity for environmental education, environmental educators need to offer greater support to teachers and others already involved in the myriad of small-scale projects, innovations and changes that are happening in schools. Unfortunately, disparaging such efforts seems to be the norm, with small-scale achievements often criticised and dismissed as second-rate and inadequate because they fail to be appropriately "critical" or of significant scale or impact.

Like many of my colleagues, I have held the view, expressed by Wals and Alblas (1997, p. 253), that "despite their good intentions, many environmental education projects seem to fall short in realising ambitious learning goals". However, I now believe that many environmental educators are profoundly negative in their thinking and hold "deficit" viewpoints about others' achievements. This blinkers us to the recognition of small wins and to seeing these as successes. We have tended to focus far too much on shortcomings, difficulties and inadequacies of efforts and outcomes, leading inevitably to feelings of frustration and failure in terms of environmental education achievements, rather than appreciating their strengths.

A critical orientation explains to us that educational change is very difficult. Yet there is a tendency to be dismissive of many of the initiatives that are developed, because they do not fully meet critical criteria. I believe we have become too "critical" in our interpretations of environmental education programs, practices and resources and need to rebalance these appraisals with greater understanding about, and appreciation of, the genuine difficulties of creating educational change. I believe we need to (re)consider our relationships with (non-specialist) teachers, administrators and others working in schools on a daily basis, and to be more patient with, and accepting of, the slow and ordinary small wins that result.

This presents a challenge to environmental educators who, from positions of authority and with well-articulated theoretical perspectives, seem too ready to be critical about the work of teachers seeking to create change in their local settings. We do this without fully appreciating the genuine difficulties that exist for teachers working in schools. As this study has confirmed, teachers are working in busy, complex environments, often within social relationships that are fragmented and fragile. Furthermore, many teachers do not have the benefit of coherent theory to guide their work, and few opportunities to reflect upon what they do. Professional development is a "grab bag" of programs, practices and personal interests while environmental education professional development is virtually non-existent.

I believe we need to use our theory-work and expertise to "get dirty" in the field. Instead of negativism, we need the "reality check" of practical experience to help us appreciate the constraints placed upon teachers in schools. We need to balance critique with greater encouragement, provide constructive support, and share some of the effort of creating change. We need to help build teachers' capacities, to rub shoulders with teachers as critical friends, rather than critics. We need to celebrate their small-scale achievements as praiseworthy steps leading towards sustainability, even if they are small and imperfect, because these changes are being hard won in complex and difficult social, educational and political environments.

MY LEARNING ABOUT COLLABORATIVE (ACTION) RESEARCH

This final section about learning from practice focuses on what I have learnt about collaborative action research. As has been articulated in chapter 2, this study was established as a clear departure from "traditional" models of theory-into-practice. These have historically seen university-based researchers generate research questions for teachers who, in turn, are expected to respond and then have little more to do with the research project. There is a growing literature, however, about forms of collaborative research, including action research, which recognise that teachers, as well as university researchers, are also generators of knowledge, and that research action is a shared responsibility of both teachers and researchers. While the literature about collaborative research abounds with discussion about the best ways to democratically and equitably conduct this kind of research – "to develop the true collaborative spirit and practice" (Potter, 2001, p. 8) – it is my purpose here to problematise such approaches and to raise issues and dilemmas founded upon the reality of working in this research project. These are that: democracy in research is an unattainable ideal; there are dilemmas in "giving voice" to research participants; there are hidden challenges in building relationships with research partners; balancing reflection and action can be very stressful; it is a challenging process to maintain personal interest and momentum for the research; and writing an action research thesis is a major struggle. Each of these issues is now discussed in detail.

Issue 1: *Democracy is an Unattainable Ideal*

Perhaps the major problematic aspect of conducting collaborative research resides in the nature of democratic practice. For reasons of ethics and personal values, this research project was set up to be participatory and to ensure that action would result. My intention was to involve as many teachers as possible and to guarantee that they had "ownership" of the project. The aim was for the project to be a joint construction, managed cooperatively

between the teachers and the academic researcher. While this was a noble objective, questions about how democratic and participatory this process has been, or indeed, could ever really be, must be asked. It was essentially *my* decision to conduct this research as a participatory endeavour and, even though I sought confirmation to use such an approach, other alternatives were never really contemplated.

Furthermore, and despite my best efforts and commitment to the development of democratic decision-making, I am still seen as the "expert" in environmental education in the school and, therefore as project leader, though perhaps less strongly than initially. It seems that it is easier for me to give away power than for others to take it up. The invisible power of the academic researcher is deeply entrenched in our relationships with teachers and will require a cultural shift in research practice that changes both researcher practices and teachers' capacities to claim power. As this project has shown, the complexities of teachers' work, and the micro-politics of their relationships, allied with a long history of powerlessness in research decision-making, has meant that teachers cannot readily embrace the new culture of collaboration, democracy and autonomy that is offered. Changing the culture of research is also a fragile, complex and evolutionary process.

Contributing to this complexity and fragility is the realisation that power relations change constantly. They wax and wane depending on factors such as the nature of a specific task, a person's confidence and competence to take on a particular task, the range of competing commitments at any point in time, and who has best access to people and resources in order to complete a task. In this project, there was no straightforward shift towards power- sharing. On a number of occasions over the life of the project, I thought that the "breakthrough" to full collaboration had arrived; only to find that this was not really so. The resulting collaboration is best described as episodic, rather than as a truly shared understanding. Even at the end of the project, I was aware that my continuing participation and leadership remained important drivers in finalising "loose ends". Overall, this project has only been partly owned by the school, and certainly not by a large number of teachers. Nevertheless, I am hopeful that the butterfly effect will contribute to deeper and wider developments over time, provided that collaborative curriculum development and further professional development in environmental education continues into the future.

Issue 2: *"Giving Voice" to Research Partners is Problematic*

I came into this study with the belief, also shared by Potter (2001), that teachers' voices have been largely silent in the research literature about teaching and schools. In this study, I wanted to change this situation. One of the ways I hoped to redress this imbalance was

through providing multiple opportunities for teachers' voices to be represented throughout the research process. Hence, my research and professional development practices were framed to provide for teacher inputs, as well as opportunities for reflection on the research processes. Nevertheless, while offers to participate were generally welcomed, I found that the teachers were not interested in formally reflecting upon or offering critique about the processes, despite my attempts to encourage this. In the end, it is my voice that is heard in this report, and my interpretations of teachers' thoughts and actions. The plural structure that I had sought did not happen. I am aware that this distorts the story of this research by filtering it through *my* eyes, *my* perceptions, *my* experiences and *my* theories. I could not force the teachers to "give voice" and thus this was just one more aspect of democratic practice that was discarded as the project progressed.

Issue 3: *Relationship-Building Holds Hidden Challenges*

One of the biggest challenges in this study was building and maintaining the interpersonal relationships needed to keep the research going – indeed, this aspect dominated the study. Regular, personal contacts are time consuming, but extremely important. Such interactions are much more than asking teachers to fill out a questionnaire or to be interviewed (tasks that are often allocated to a research assistant in traditional research approaches). Action research requires regular, face-to-face contact with participants. Information, perspectives, plans, history, and "secrets" about the context and its people will not be revealed to a researcher who has not earned the insiders' trust. Once trust has been earned, however, there are high expectations for researcher inputs and outputs, which must then be honoured.

I found that one of the most consistent roles for me was that of motivator and energiser. This required prolonged and repeated engagement. There were numerous visits to the school where little was gained in advancing the project, except for building and rebuilding relationships, trust, motivation and energy. Sometimes, this became frustrating and contributed to the slowness of the project, especially as my own motivation and energy also faltered at times. However, this interpersonal focus, especially between Jo and me, also conspired to limit wider involvement with more teachers. I just did not have the additional time or emotional energy to invest in building relationships with other teachers in the school, in any significant way. As a consequence, it is likely that the pace of the project was impeded. Participation and progress were founded as much in personal and inter-personal relationships as in more obvious aspects of the project, such as teacher knowledge and interest in environmental education.

Issue 4: *Balancing Reflection and Action is Stressful*

Another challenge in conducting this research was balancing time between the research aspects of the project and its action components. Burchell and Dyson (2000) and Dick (2000) both acknowledge the dilemma of keeping the wider research enquiry alive, while facing the imperative to act. At times, I found it difficult to carry out these tasks simultaneously, and looked forward to the holiday breaks in the school and university calendars to focus more on "research" components, such as reading literature and transcribing interviews, while dedicating most of the term time to "action" work in the project with members of the school. This meant that there were few breaks from the study, overall. At times, when reflection and action processes converged, the whole process became quite stressful.

Part of the dilemma is that action research blurs the distinction between theory and practice. The continuous learning that happens throughout the cyclical inquiry processes that create reflection, planning, action and further reflection, also makes it difficult to distinguish between the "research action" and the "action research". In the end I resolved this dilemma by constituting my work as involving "two interdependent yet complementary phases of the change process" (Winter, 1996, p. 14). One phase was the project of developing this thesis (the action research), and the other was the collaborative school learnscaping project (the research action). Once I was able to distinguish between these two facets of the project, I was also better able to differentiate project tasks, and to keep up-to-date with both enterprises, even though theory and practice were conceptually intertwined.

Issue 5: *Maintaining Personal Interest and Momentum is Challenging*

As this thesis writing and the project on which it is based have finally concluded, I can honestly say "I have had enough". In the final stages, my commitment to completion of the study was driven more by my desire not to have it as part of my life than by any attachment to the value of the study. While I expected that the thesis writing process might take a number of years, I never expected that I would also be involved in the learnscaping project for the same length of time, and became quite fatigued by its continuing demands.

There is much written about the demands of collaborative research, but I have read little in the literature about the impact of collaborative research on other spheres of a researcher's life. I have found this juggle between the personal and the professional, to be a major difficulty, especially as both have been additional to full-time work and family commitments. I believe this is a form of "volunteer burn-out". Academic researchers working in traditional research projects usually collect their data then withdraw from the

research site, or have only limited additional contact. As a consequence of such intense engagement, I suggest that researchers not contemplate collaborative research unless they have support and understanding from those closest to them. Dick (2000) also suggests creating, or joining, a support network of other higher degree candidates in an action learning set, to provide each other with mutual support and challenge. Fortunately, I had the benefit of two such networks and realise, retrospectively, that I should have accessed the support more frequently, especially in the later stages when my personal motivation was lowest. Davies and his colleagues (in Dick, 2000) suggest supplementing regular and infrequent meetings with supervisors with regular and frequent meetings with the action learning group, as a useful way of offering a practical solution to maintaining interest and overcoming the frustration and isolation that can afflict post graduates.

Issue 6: Writing an Action Research Thesis is a Major Struggle

I never anticipated that writing this thesis would become so complex and challenging. Initially, I assumed that I would follow a traditional thesis structure of separate chapters for the research overview, literature review, methodology, results, discussion and conclusion. However, as I began to write, I came to realise that this structure was inadequate for writing about action research, a process that is a data-driven and responsive study, rather than being largely theory-driven. Thus, part way through the writing process, I was challenged to devise an alternative structure, which I believe better reflects the conduct and style of action research. Winter (1996) maintains, for example, that "the narrative format can be seen as expressing and recognising the basis of action research – the sequence of practice and reflection" (p. 26). Hence, narrative became a significant aspect of this thesis.

Additionally, because the literature informing this study emerged from, rather than dictated the research, I have placed reviews of literature throughout the report, rather than as a single distinct block at the beginning of the thesis. Another aspect of the traditional thesis format that I discarded is the tone of disengagement that reinforces and expresses the researcher as the expert. Consequently, I have written much more personally in style, tone and vocabulary, and sought to blend varied themes and general reflections with accounts of everyday events.

These changes resulted in a major restructuring of the thesis format as the study proceeded. While this was a challenging process, I believe the current structure and style better represents how this study evolved, and how the people concerned and the context in which it happened are presented. Participants were never simply background to the study, but deeply embedded in the design, events, processes of evaluation and reflection, and in the final

outcomes. I trust that this new structure gives appropriate respect to these multiple and complex features and relationships.

CONCLUDING COMMENT

As I stated at the beginning of this chapter, this thesis is a work in progress about a research journey. The learnscaping project had its genesis well before I became involved with the school and will continue into the future. It is nowhere near its conclusion, with several action cycles still to come. I have also not finished reflecting upon the project, or completed my theorising about the study. Nor have I finished my own learning about schools, educational change and environmental education, even though this thesis is finished. Consequently, I do not offer any definitive conclusions, any neat solutions, nor do I seek to propose blueprints for others to follow. As Kappeler comments:

> I do not wish to conclude and sum up, rounding off the argument so as to dump it in a nutshell for the reader. A lot more can be said about any of the topics I have touched upon….The point is not a set of answers but making possible a different practice. (cited in Lather, 1991, p. 159)

I do not prescribe ideal practices for creating educational change, for environmental education, or for action research. This research work has been too fraught with its own imperfections to presume to do this for others. Nevertheless, I would not significantly change the experiences and perspectives that this journey has provided, because of the richness and deep personal learning that has resulted. My next challenge is to decide how to continue to review my work and life practices so that they become different, based on what I have learned. I expect that this will also be a slow and evolving process.

Central to this process will be a search for ways to support the many committed teachers already striving to include environmental education into their curriculum, and to give them encouragement to continue. I will also seek ways to enlist new teachers to take up environmental education and include it in their day-to-day teaching. Within the current structures of schooling, and the demands of teachers' daily work, attempting to be innovative can be very difficult for many teachers. Realistically, their efforts will be small wins, not the grand transformations hoped for by those armed with knowledge of the worsening environmental and social conditions of the planet, and who wish to see changes happen extensively and quickly.

As I have articulated throughout this thesis, a re-theorising of environmental education is required. Even though I sought to apply critical theory and to use a participatory,

empowering research process, these intentions were not enough to bring about the transformations that I had hoped would emerge as the project progressed. Critical theory has served the field of environmental education well in helping to explain why educational change is difficult. However, I believe it is time to expand our theoretical frameworks and to reach beyond critical theory to create new possibilities for action and transformation.

The challenges of sustainability are too great, and the implications for children and future generations, too severe for environmental educators to be timid about changing their own theories and practices. In a rapidly changing world, we also need to change and to be more responsive to new and emerging challenges. The task for environmental education, especially, is for engagement and re-engagement with practitioners in schools in positive and supportive ways. Being an expert armed with theory and critique, but rarely experiencing the dilemmas, frustrations, resistances and constraints involved in working in a real context to create change has never been, and cannot be, an adequate response to these times of uncertainty, complexity and change.

Finally, educational change requires a communal effort. It is not only teachers who need to be educated about environmental education; environmental educators need to be educated much more about teachers' work and to understand the complex and diverse contexts in which they operate. Collaborative partnership approaches, grounded in positive relationships, are vital. The groundwork for change is already being laid in many schools and classrooms. Beyond this, however, is the need for "going to scale", where networks are enlarged, ideas are disseminated, and possibilities are expanded. When teachers and school communities seize upon the potential of complexity and diversity in their settings, then environmental education can hopefully play a vital role in the development of commitment and action for sustainability into the millennium. The journey has begun. The wings of the butterflies are flapping. The storms of change are approaching.

Figure 6.1. from *The Australian Magazine*, June 16-17, 2001, p. 14.

Appendices

APPENDIX A: Full List of Case Record Contents

Shaded items indicate the data sources directly referred to in this thesis.

CYCLE 1

DATE	TYPE OF DATA	REFERS TO
29/7/94	Newspaper article	"Protesters ready for the big fight: eight schools affected" *Courier Mail* article discussing opposition to government plans to construct a freeway through koala habitat and schoolgrounds in Logan City, south-east of Brisbane.
1997	1997 Information Handbook	Fernwood State School Prospectus detailing school mission statement, committees, policies and curriculum outlines.
15/1/97	Reflective journal	First journal entry reflecting on dilemmas in conducting the school project as well as doctoral research.
24/1/97	Information package Meeting briefing notes	Introductory project notes sent to school outlining a potential project plan and timeline for the learnscaping project: articles on environmental education and environmental education projects. Outline of broad plans for the learnscaping project.
13/2/97	Reflective journal	Outline planning for *Earthworm Project* identifying ownership issues and indicating forward planning.
21/2/97	Email to supervisor	Message highlighting ownership issues in project decision-making.
27/2/97	Reflective journal	Highlights difficulties with development of school "story" and notes identifying need for activities and resources for teachers working outdoors.
13/3/97	Planning concept map Reflective journal Resources list	Jo's planning guide for development of Term 2 *Earthworm Project.* Outlines resourcing issues and reinforces teachers' busy schedules. Children's picture books with environmental themes.
18/3/97	Email exchange	Jo's thankyou for previous visit and indicates decision to hire storyteller. Julie provides web addresses for environmental education resources
20/3/97	Reflective journal Resources	Discusses environmental education issues explored with Jo and Ann eg. wildlife corridors, urban development, sustainability, intergenerational equity. Discussion articles on wildlife corridors, urban development, sustainability, intergenerational equity.
24/3/97	Reflective journal Curriculum plans	Emphasises importance of documenting curriculum activities developed for Earthworm Project. Story thread concept finalised. Realisation of role as process consultant. Integrated curriculum plans for early childhood classes "Birds".
4/4/97	Email from Faculty	Suggests a video case study about learnscaping at Fernwood highlighting educational innovation
10/4/97	Email to Jo Email from Jo	Advice re video and learnscaping article. Initial acceptance for video and writing of article.
18/4/97	Reflective journal Email to Jo Email from Jo Website details	Reflection on meeting discussing storytelling process including emphasis of the project on students' care and ownership of grounds. Information re story teller and web page development: advice re website for Hawaiian school also developing learnscaping. Expresses satisfaction with the day's meeting and acknowledges my inputs. Identifies storyteller's personal website.
2/5/97	Observation notes	Observations of storyteller sessions with Years 1/2 and later Years 3/4/5, highlighting local animals, people and school setting; children very enthusiastic participants.
8/5/97	Email from Jo Draft journal article	Indicates article is completed and ready for forwarding. States that storyteller will return with three redrafted 'school stories". Final draft of Jo's article "Environmental Education at Fernwood State School" for Australian Journal of Environmental Education.
9/5/97	Email to Jo Draft journal article	Complimentary comments re the article. Julie's final draft "Bringing it all together" for Australian Journal of Environmental Education.
26/5/97	Email from Jo	Information re storyteller's return visit to finalise stories and advice that quilt squares are progressing.

28/5/97	Fax Reflective journal	Invitation to attend Under 8s Week Rainbow Lorikeet Day Observations of Under 8s Week activities, integrated with "Birds" theme. Conversation with parent noting her privilege to have children at the school.
30/5/97	Email from Jo	Discusses confusion over "ecoschool" concept. Expressed satisfaction with Under 8s Week activities.
4/5/97	Research protocols letter	Letter to principal outlining Ph D research project, researcher roles, data gathering processes and protocols.
12/6/97	Meeting notes	Outlined story selection processes for development of "enduring" story. Highlighted dissension in decision-making processes.
17/6/97	Reflective journal	Reflections on the nature of the research problem; articulation of project focus; comments suggesting need for interviews.
18/6/97	Program Fernwood learnscaping stories Observation notes Case study article Interview schedule Interview schedule Interview notes	Program for presentation of Fernwood Stories. Three linked stories developed by children and storyteller. Observations of the ceremony for the story handover. Copy of article about Ardtornish Primary School, S.A. given to Jo. Questions for principal's interview. Questions for focus group discussion with early childhood teachers. Details of interview conditions and process
19/6/97	Transcript Transcript Email from Jo	Transcript of principal's interview. Transcript of focus group discussion. Enthusiastic comments re story handover ceremony and acknowledgment of interpersonal style.
9/7/97	Email to Jo and Ann	Acknowledgment of Koalathon invitation and re-establishment of contact after semester break.
11/7/97	Email from Jo	Initial contact after semester break identifying date for Earthworm entry.
15/7/97	Email to Ian, Jo and Ann	Request to accept visitor from U.K. to observe environmental education programs.
18/7/97	Email from Jo	Acceptance of invitation for visitor.
25/7/97	Event schedule Photographs	Program for Koalathon Ceremony, and handover of care quilts to Ronald McDonald House. Photographs of Koalathon Ceremony.
28/7/97	Reflective journal	Account of Koalathon Ceremony and foreshadowing of videoing of learnscaping case study.
28/8/97	Reflective journal	Account of videoing and comments from Jo revealing staff tensions in relation to Earthworm/environmental activities.
4/9/97	Email to Jo Email from Jo	Request for interview with Jo and other available teachers. Confirms interviews and discusses future planning.
11/9/97	Interview schedule Interview schedule Interview notes	Interview questions for Jo. Interview questions with middle school teacher. Discusses interview process and main ideas drawn from interviews.
17/9/97	Transcript	Transcript of Jo's interview.
21/9/97	Transcript	Transcript of middle school teacher's interview.
17/10/97	Email to Jo Email from Jo Information package	Request from supervisor for ASEAN environmental educators to visit school. Notification that school did not win national Earthworm Award. Range of materials about school-based environmental education and learnscaping delivered during ASEAN visit.
15/11/97	Meeting notes	Summary of meeting at Fernwood for Queensland Early Childhood Environmental Education Network showcasing school's environmental education projects.
25/11/97	Email to Ann	Thank you for hosting meeting and request for interview.
3/12/97	Transcript	Transcript of interview with Ann.

CYCLE 2

DATE	TYPE OF DATA	REFERS TO:
25/1/98	Reflective journal	Discusses frustration with momentum of project and impact of personal work pressures. Reconsiders researcher role and need for proactive stance.
5/2/98	Letter to principal Forward planning guide	Letter suggesting need for renewed plans for action. Suggestions sent to school considering ways forward with the project.
25/2/98	Reflective journal Planning concept map Edited concept map School survey responses	Discusses first 1998 meeting re plans for action and 1998 Earthworm project, showing environmental education principles; reveals expansion of Jo's views of environmental education. Jo's plans for 1998 Earthworm Project showing the influence of environmental theory presented in 1997. Edited version of above. Results of parents' survey at the school showing the importance of the school's environmental education program to school selection.
10/3/98	Email from Jo	Confirmation of arrangements for interviews with parents.
11/3/98	Interview schedule Transcript 1 Transcript 2 Draft policy	Interview questions for parents. Transcript with parent (also part time teacher at the school). Husband also environmental educator at local environmental centre. Transcript of focus group interview with parents (P&C executive). Draft rationale for school's environmental education policy
20/3/98	Email to Jo	Confirmation re visit and reinforces need for comments on draft policy.
25/3/98	Reflective journal Map	Identifies shift in focus from whole school environmental policy back to learnscaping curriculum; discusses format for same; questions "expert" perception of my role; clarifies project direction and purpose Mudmap of learnscaping circuit
1/4/98	Email request for interview Email from storyteller Email interview schedule	Request for interview with storyteller. Confirms willingness for email interview. Interview questions emailed to storyteller.
13/5/98	Email interview schedule.	Resent interview questions due to hard drive failure.
14/5/98	Email to Jo	Resumes contact after computer crash; confirms format and criteria for learnscaping curriculum document.
17/5/98	Email interview response	Emailed responses to interview questions from storyteller.
20/5/98	Email to storyteller Meeting planning notes Draft Learnscaping format Reflective journal	Follow-up thank you email. Identifies information/ resources needed to help in designing learnscaping curriculum document Beginning documentation for learnscaping folder content including rationale, principles, content areas – left for feedback Reflections on first face to face meeting with Jo and Ann for 2 months; appraised of problems between Earthworm and *Tidy Schools* Project teams; positive acknowledgment of learnscaping documentation; expresses concerns re lack of critical focus; raised suggestions for professional development day.
25/5/98	Transcript	Interview transcript with two environmental educators mainly about strategies for teachers working outdoors with children.
27/5/98	Reflective journal	Meeting to seek feedback on learnscaping draft; general satisfaction; confirmed availability for professional development on pupul-free day; includes comments re slowness of project.
10/6/98	Draft planning proforma Reflective journal Invitation	Suggested planning proforma to assist with teacher inputs during planning session. Discusses use of planning proforma and draft agenda for professional development session. Invitation to 1998 Koalathon official ceremony.
20/6/98	Email from Jo	Confirms details for two professional development sessions; raises option of employing consultant to write school's learnscaping curriculum.
23/6/98	Email from Julie	Dismisses option of consultant on the grounds of teacher ownership.

	Email from Jo	Indicates disillusionment with teaching a events at school.
24/6/98	Email for Julie	Support and encouragement.
25/6/98	Email from Jo	Message from Ann re invitation to be presenter at early childhood science evening for parents.
26/6/98	Email from Julie Email from Jo	Confirms acceptance of invitation and indicates enjoyment at writing up rationale for learnscaping curriculum document. Friendly end of term sign off.
5/7/98	Article Preparation notes	Article in Going Potty showing Fernwood as finalist in Tree Planting School Award Category for Arbour Day Awards. Notes re content of learnscaping program and inservice workshops.
6/7/98	Agenda Draft rationale Workshop task sheets Planning proforma	Agenda for staff inservice. Draft of learnscaping program rationale. Activities for teachers to facilitate outdoor learning activities. Proforma to assist teachers in development of outdoor activities.
7/7/98	Reflective journal	Discusses teacher reactions to environmental challengers; outlines how the workshops proceeded; including teacher responsiveness to outdoor segment; provides options for future project development.
14//7/98	Letter from principal	Thank you letter for workshops and past activities.
15/7/98	Email to Jo	Discussed arrangements for next meeting to advance the project.
22/7/98	Reflective journal TV script	Contains debriefing after teacher workshops; expresses perception about teachers interest; organises for follow-up workshop. Ann's script for a TV program about children's participation in environmental activism.
29/7/98	Note	Comment about my acceptance as "a real friend to the school".
5/8/98	Email from Jo	Confirms follow-up workshop.
6/8/98	Email to Jo	Discusses progress on learnscaping rationale and organises workshop time.
7/8/98	Email from Jo Reflective journal Integrated curriculum models	Confirms workshop details. Discusses planning for workshop especially article on integrated curriculum approaches and relevance to critical environmental education. Curriculum models discussed in Drake article.
14/8/98	Workshop materials Map	Agenda; overhead for workshop; project timeline; summary of teachers' ideas from 6th July workshops; notes for teachers on integrating environmental education into the curriculum. Detailed map of schoolgrounds.
19/8/98	Reflective journal	Discusses workshop including teacher responses; suggests plans for continuing development; highlights shift in project ownership to school personnel.
27/8/98	Email to Jo	Seeks progress report on teachers' curriculum planning and desire for interviews with teachers.
2/9/98	Email from Jo	Confirms teachers working on curriculum development; notifies of forthcoming visit by Ann and Jo to learnscaping school in NSW.
3/9/98	Email to Jo	Confirms next meeting and paper on outdoor learning environments at playground conference.
8/9/98	Meeting notes Map Timetable Interview schedule Transcript	Discusses progress on teacher planning and update on Jo's actions re development of learnscaping program, including children's involvement in activities. Updated map of the learnscaping circuit Proposed schedule for teacher release for group curriculum planning Questions for the language planning focus group. Transcript of focus group interview with language teachers.
10/9/98	Note to Jo	Covering note for draft learnscaping program.
22/9/98	Email from Jo Email from Jo	Message that she is back online with home computer. Indicates good progress being made with learnscaping program and that teacher aide has been contacting publishers for copyright clearance
14/10/98	Email to Jo Email from Jo	Request for feedback on learnscaping materials. Indicates progress on formatting teachers' curriculum materials.

18/10/98	Email from Jo	Indicates unsatisfactory visit to learnscaping school at Byron Bay.
26/10/98	Email to Jo	Confirmation for next visit.
28/10/98	Draft of Learnscaping curriculum Reflective journal	First draft of Learnscaping document including my rationale and teachers' integrated curriculum planning developed after workshops Comments on my value in maintaining project momentum; feedback on visit showing pitfalls; discussed finalisation of program and possible extensions.
2/11/98	Email to Jo	Request for further interviews.
11/11/98	Interview schedule Interview notes Transcript	Questions for Maths curriculum focus group. Outlines interview procedure and highlights key issues. Transcript of focus group interview with Maths teachers.
26/11/98	Email to Jo Information sheet School prospectus	Request for interview with principal and Jo. Information sheet about Smogbusters' *Way to School* program. 1998 school prospectus highlighting environmental education and learnscaping.
2/12/98	Interview schedule Interview notes	Set of questions for principal and Jo. Outlines procedures for interviews with principal and Jo; highlights key issues.
4/12/98	Transcript	Transcript of interview with Jo.
8/12/98	Transcript	Transcript of interview with principal.

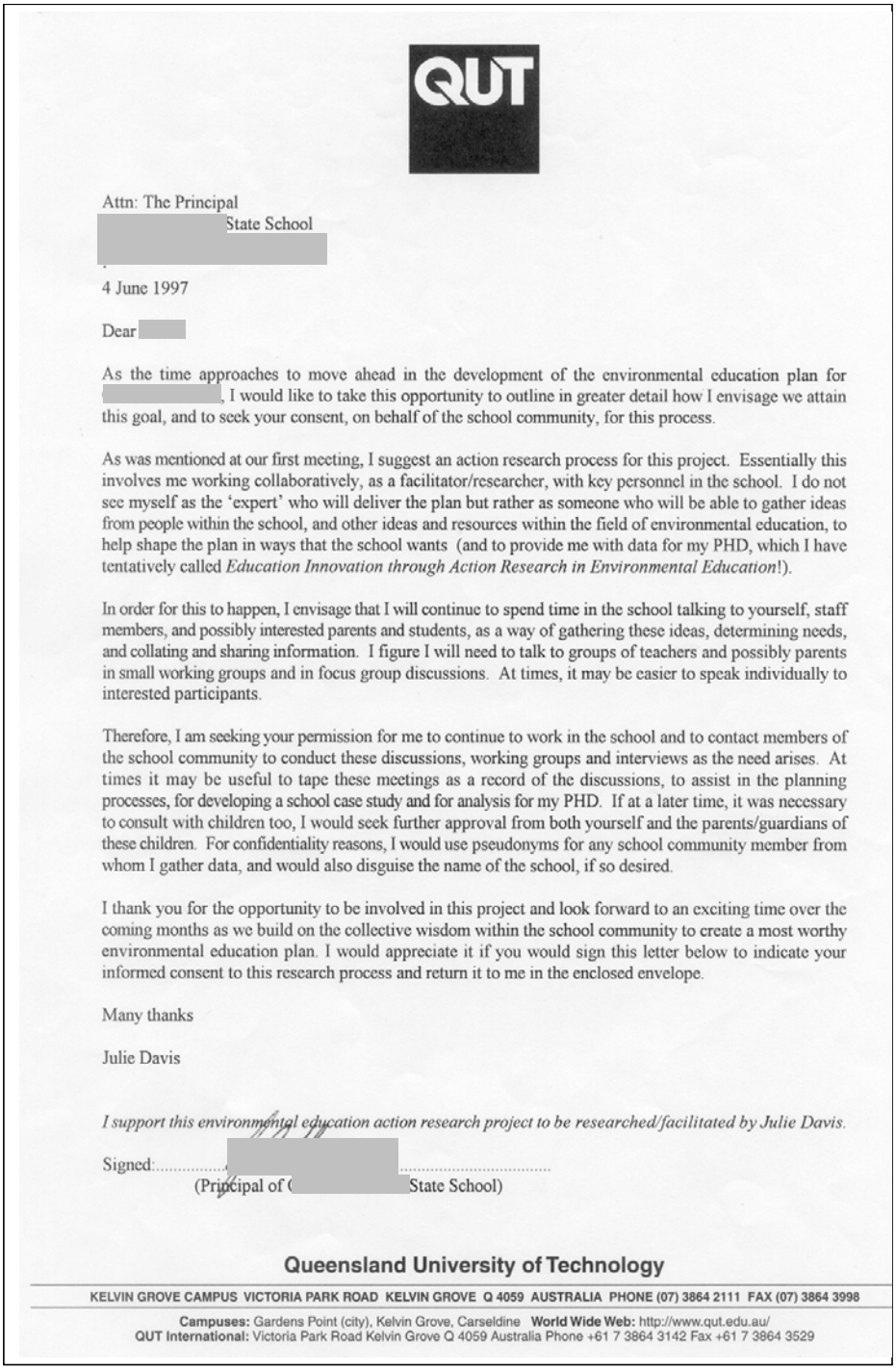
CYCLE 3

DATE	TYPE OF DATA	REFERS TO:
2/1/99	Conference paper	Paper using learnscaping project as case study in early childhood environmental education.
15/1/99	Conference paper	Paper using learnscaping project as case study in educational innovation.
13/2/99	Letter from Ann	Thank you re information on litter-free lunch distributed to early childhood teachers and advice re immanent long service leave.
14/2/99	Email from Jo	Request to act as referee for Allen Strom Eureka Prize submission. Also includes details of history of awards won.
16/2/99	Referees report	Report in support of Allen Strom Eureka Prize submission.
18/2/99	Email from Jo	Thank you for referee's report.
29/3//99	Card from Julie	Easter card sent to school to keep links going. And suggesting visit in Term 2.
14/4/99	Email to Jo	Request for meeting.
15/4/99	Email from Jo	Agreement to meet; states that Earthworm not happening this year as staff wish to give it a rest.
19/4/99	Email from Jo	Confirming visit.
21/4/99	Reflective journal Prospectus	Indicates details about Earthworm, eg Jo needing a break and taking long service leave; learnscaping program making little progress, partly due to lack of funding for publication. Observations reinforced the stress and busy-ness of the school. 1999 School prospectus.
4/6/99	Email from Jo Email to Jo	Confirms immanent long service leave and request to visit. Confirms visit.
15/6/99	Invitation	Invitation to attend 1999 Koalathon.
2/7/99	Email to Jo Email from Jo	Re-establishing contact and indicating late completion of learnscaping rationale. Acknowledges new deadline.
16/7/99	Email to Jo Email from Jo	Identifies work completed on the rationale. Indicates no pressure to complete learnscaping tasks especially as she is on long service leave.
24/7/99	Email to Jo	Makes another deadline.
25/7/99	Email from Jo	Acknowledges work being completed.
13/8/99	Email from Jo	Acknowledges arrival of package containing learnscaping program.

21/10/99	Catalogue Reflective journal	Catalogue for Eco-Art Exhibition. Expresses disappointment at quality of art and any real links to environmental themes; informed about crash of Jo's hard drive, losing the learnscaping program; indicated advanced planning for Earthworm 2000.
16/11/ 99	Email to Jo Email from Jo	Contact to keep links and to inquire of project progress. Indicates distraction with other projects and that learnscaping project "on hold" but to be resurrected during the Christmas holidays.
21/2/00	Email from Jo Email to Jo	Notification about time off for Jo to work on learnscaping program; seeks advice re education Queensland Showcase Awards. Organises for visit and provides some advice re Showcase Awards.
6/3/00	Reflective journal	Identifies learnscaping program needs culling and seeks advice; discusses Earthworm project 2000 connecting with Olympics – a major event; discussion of the negative impacts of staff dynamics.
14/3/00	Email from Jo	Request for reference to support Showcase Award submission.
15/3/00	Email to Jo Reference	Acceptance of above request. Reference to support Showcase Award submission.
28/3/00	Criteria sheet	Suggested criteria for editing learnscaping activities.
2/4/00	Email to Jo	Organises visit for culling purposes.
3/4/00	Reflective journal Date claimer Project planning sheet	Expresses frustration at Jo's lack of focus on the learnscaping project; discusses use of criteria for culling materials; discusses comments from part-time teacher/parent re lack of commitment to environmental education. Date claimer for 2000 Olympics Koalathon community event. Guidelines and suggestions for teachers for project Leo (Earthworm event).
5/11/00	Email to Jo Email from Jo	Making contact and arranging visit. Confirms visit.
9/11/00	Reflective journal	Discusses difficulties maintaining momentum for the project from both my own and Jo's perspectives; discusses push for project closure by making weekly visits; discusses major interpersonal difficulties with Jo impacting on project and beyond.
22/11/00	Email from Jo	Seeking advice re content for learnscaping program.
1/12/00	Email from Jo Email to Jo	Discusses escalation of Jo's interpersonal problems with two staff members leading to union action. Offers support and arranges meeting.
12/12/00	Email from Jo	Request for personal reference in relation to union action.
20/12/01	Testimonial	Testimonial in support of Jo's professionalism and collaboration.
31/12/00	Email from Jo	Expresses thanks for testimonial.
27/3/01	Email to Jo Email from Jo	Notification of return from India; queries the state of grievance matter and progress on learnscaping manual. Contains welcome back; discusses lack of progress on grievance; notes learnscaping program almost finished; discusses possibility of publication by Open Access and on website; discusses lengthy process of getting copyright clearance.
4/4/01	Email to Jo Email from Jo	Expresses surprise at near completion of program; organises for visit. Confirms visit; confirms continuing lack of progress re grievance.
13/4/01	Email from Jo	Gives thanks for visit and acknowledges personal and program support.
26/4/01	Email to Jo Email from Jo	Acknowledges kind words; organises for visit. Confirms visit.
15/5/01	Email interview	Questions to Jo seeking reflections on aspects of learnscaping program.
25/5/01	Email to Jo Email from Jo	Seeks acknowledgment of attendance at Website launch. Confirms attendance at launch; provides notification of minor editing of learnscaping program.
26/5/01	Email to Ann Email from Ann	Seeks acknowledgment of attendance at Website launch. Acknowledges attendance and willingness to be a speaker.
28/5/01	Email to Jo	Acknowledges confirmation of attendance.
14/7/01	Email to Jo	Re-establishing contact after semester break; requests advice on progress of

		learnscaping manual.
19/7/01	Email from Jo	Indicates final draft almost ready, presented to principal for overview; expresses frustration with obtaining copyright clearance on final items.
7/8/01	Email from Jo	Indicates end of class-free time to complete manual; includes complimentary comments from principal re manual and queries ways to build school ownership of the document.
8/8/01	Email to Jo	Organises for visit.
11/8/01	Email to Jo	Seeks responses to questions querying staff uptake of learnscaping program.
15/8/01	Email from Jo	Provides responses to questions indicating difficulties with teachers understanding the nature of environmental education; notifies about school as finalist in the Green and Healthy Schools Awards.
26/8/01	Email from Jo	Notifies of completion of learnscaping manual and regional winner of environmental award.
27/8/01	Email to Jo	Offers congratulations on both accounts.
28/8/01	Email to Jo Email from Jo	Notifies of minor edits needed. Notifies of inspection by printer.
6/9/01	Email to Jo	Requests reference from Jo re another learnscaping consultancy.
9/9/01	Email from Jo	Indicates offer to be referee; comments printer still examining copy of manual.
1/11/01	Email to Jo Email from Jo	Asks re printer's quote and whether resolution to grievance process. Discusses $6 000 quote for 50 copies, and principal's willingness to proceed.
13/11/01	Email from Jo Email to Jo	Indicates proceeding with printing after minor adjustments, supposedly available within two weeks and ready for 2002 school year; indicates principal's keenness for inservice. Expresses availability for inservice on pupil-free day in January.
14/11/01	Email from Jo	Discusses options for inservice.
15/11/01	Email to Jo	Seeks to clarify arrangements for inservice workshop.
19/11/01	Email from Jo	Sets a date and discusses hopefulness at availability of published copies of learnscaping manual for the workshop.
20/11/01	Email to Jo	Reiterates need for completed manual for staff inservice workshop
26/11/01	Email from Jo Email from Principal	Indicates final changes needed to manual which delay publication, but still hopeful of immanent completion. Congratulatory email from Principal, indicating great satisfaction with the manual and desire for my facilitation at launch with teachers in the New Year.
27/11/01	Email to Jo Email from Jo Email to Principal	Confirms address to send publication to Julie over the holiday break. Acknowledges forwarding address; indicates availability over holiday break. Acknowledges acclamations re publication and confirms desire to provide a "launch" for the publication on pupil-free day in January.
29/11/01	Email from Principal	Confirms time and date for inservice and launch.
5/12/01	Email from Jo	Comments on industrial difficulties and progress with printing of final copies of Learnscaping manual.
6/12/01	Email to Jo	Confirms inservice details and contacts over holiday break
10/12/01	Email from Jo	Confirms arrival of final draft of *Learnscapes Alive*, prior to printing.
21/12/00	Email to Jo	Response to comments about the disputation and organised for delivery of own copy prior to final workshop.
29/12/01	Email from Jo	Suggests collection date in January just prior to workshop.
4/1/02	Email from Jo	Confirms collection in late January.
7/1/02	Email form Julie	Reconfirms date and time for collection of resource.
22/1/02	Final project document	*Learnscapes Alive* curriculum document.
25/1/02	Workshop plan	Plan for final implementation and hand-over workshop for manual.
25/1/02	Plans for 2002 project Reflective journal	Draft plans for eco-tourism project to assist in embedding and extending learnscaping project. Discusses final workshop, staff comments and future plans.

APPENDIX B: Letter Setting out Research Protocols



QUT

Attn: The Principal
[redacted] State School
[redacted]

4 June 1997

Dear [redacted]

As the time approaches to move ahead in the development of the environmental education plan for [redacted], I would like to take this opportunity to outline in greater detail how I envisage we attain this goal, and to seek your consent, on behalf of the school community, for this process.

As was mentioned at our first meeting, I suggest an action research process for this project. Essentially this involves me working collaboratively, as a facilitator/researcher, with key personnel in the school. I do not see myself as the 'expert' who will deliver the plan but rather as someone who will be able to gather ideas from people within the school, and other ideas and resources within the field of environmental education, to help shape the plan in ways that the school wants (and to provide me with data for my PHD, which I have tentatively called *Education Innovation through Action Research in Environmental Education*!).

In order for this to happen, I envisage that I will continue to spend time in the school talking to yourself, staff members, and possibly interested parents and students, as a way of gathering these ideas, determining needs, and collating and sharing information. I figure I will need to talk to groups of teachers and possibly parents in small working groups and in focus group discussions. At times, it may be easier to speak individually to interested participants.

Therefore, I am seeking your permission for me to continue to work in the school and to contact members of the school community to conduct these discussions, working groups and interviews as the need arises. At times it may be useful to tape these meetings as a record of the discussions, to assist in the planning processes, for developing a school case study and for analysis for my PHD. If at a later time, it was necessary to consult with children too, I would seek further approval from both yourself and the parents/guardians of these children. For confidentiality reasons, I would use pseudonyms for any school community member from whom I gather data, and would also disguise the name of the school, if so desired.

I thank you for the opportunity to be involved in this project and look forward to an exciting time over the coming months as we build on the collective wisdom within the school community to create a most worthy environmental education plan. I would appreciate it if you would sign this letter below to indicate your informed consent to this research process and return it to me in the enclosed envelope.

Many thanks

Julie Davis

I support this environmental education action research project to be researched/facilitated by Julie Davis.

Signed:.....
(Principal of [redacted] State School)

Queensland University of Technology

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QUT International: Victoria Park Road Kelvin Grove Q 4059 Australia Phone +61 7 3864 3142 Fax +61 7 3864 3529

APPENDIX C: Example of Email as Conversation

[redacted], 09:58 PM 18/4/97, A Good Morning's Work

Date: Fri, 18 Apr 1997 21:58:04 +1000
From: [redacted].com.au>
Subject: A Good Morning's Work
To: j.davis@qut.edu.au (Julie Davis)

G'day Julie,

Ain't email great! I'm going to miss this thing when it goes home to where it really lives. Just love getting messages.

I was very impressed with the overall outcomes of today's meeting. Especially delighted that the idea of getting Darryl was Desley's idea. We have a super staff down at [redacted].

Email sites are always welcome. I shall have a look as soon as I get this off. As far as my Project...thank you, I think...only now I have about 20 different ideas rattling around in my head to do...and the problem is they all appeal to me. One day when I'm in the car (where I seem to get all my ideas) I'll see if I can tie them all together, or perhaps at least sort them out somehow.

Will definitely send you a copy of Darryl's timetable, as soon as I get one. Desley was going to get this organised over the weekend.

just think, video clips
and photos on your WWW site! What a challenge!

Oh...now I feel positively sick...I've only just learned how to set up a link and suddenly you have me thinking about video clips. Does sound exciting, but I think for the moment I'll just take one thing at a time. And yes, I know Gwen wants a Web page, but she seems to think I'm going to do it...which I probably will...but don't tell [redacted]...I like to keep her hanging as long as possible.

Thought any more about the case study for the AAEE journal???

Yes I have. Problem is I have managed to quite effectively put it off...for a long time now. Sorry. Do you have an actual deadline for this, because I must admit I'm a bit of a deadline person? Without them I can stall for absolutely ever. You know...one of those students you would see all the time, who rush in to see you a few days before an assignment is due to see if they can get a little bit of help...don't you just hate them?!?

Anyway, great to hear from you, and it was really great that both you and Noeleen could make it to school today...and I was very impressed that you "spoke" today. Your comments and feedback are always welcome.

Bye,

[redacted].

Oh. Did [redacted] pick up her books? Were there any missing? Please let me know, and I'll chase any "walked" books for her.

Oh, I do like email :)

APPENDIX D: Example of an Email Exchange as a Log of Events

APPENDIX E: Example of Reflective Journal Entry

APPENDIX F: Example of Interview Schedule

APPENDIX G: Excerpt from Transcript of Parent Focus Group Interview

Daryll Bellingham, 10:43 PM 5/17/98 , Re: stories at Chatswood Hills

Return-Path: <dbelling@peg.apc.org>
Date: Sun, 17 May 1998 22:43:33 +1000
From: Daryll Bellingham <dbelling@peg.apc.org>
Subject: Re: stories at Chatswood Hills
X-Sender: dbelling@mail.peg.apc.org (Unverified)
To: Julie Davis <j.davis@qut.edu.au>

Hi Julie

APPENDIX J: Journal Entry Illustrating Emerging Acceptance as Researcher/Facilitator

APPENDIX K: Contents Page for Draft Learnscaping Program (June 1998)

The Learnscaping Program: Contents

Introduction

The Environmental Challenges

The Role of Education: educating for sustainability

Environmental Education: Its nature and principles
- Approaches to Environmental Education
- The value of integrated approaches for EE
- The value of inquiry approaches for EE
- Connecting EE with KLA"s

Children and Nature

Learnscaping: Schoolgrounds for environmental learning

The Learnscaping Program
- School background and environment
- The "grounds for learning" project
- The Learnscaping Circuit
- The Learnscaping Stories

Environmental Activities for the Gardens
- Colour Garden
- Scent Garden
- Shape Garden
- Line and Texture Garden
- Koala Corridor
- The Rainforest
- The Habitat
- Aboriginal Food/ Use Garden
- Growing Garden (nursery and shadehouse)

Tips for Teaching Outdoors
- Making Magic and Adding Adventure
- Earth Carers" Code

Links to Other Activities and Projects

What Next? Possible Future Developments

Glossary of Terms

APPENDIX L: Principal's Letter of Appreciation after Workshops

Earth Carers' Code

(We share the gardens and habitats in the school with many living creatures. Here are some tips to help us live harmoniously in the natural environment).

1. **Stay on the paths most of the time. When you do go into the gardens, walk and talk thoughtfully.**

2. **When exploring living plants or animals, do this "in situ". Call others over to look, rather than taking things away.**

3. **If you have to take something, it is better to take "fallen" material rather than living material.**

4. **If you "borrow" from the gardens, put things back. Stones, twigs and bark are the homes of tiny animals and help to keep the soil from drying out.**

5. **If you really do need to take living material, take just a small piece. Don't pull plants up by the roots.**

6. **Some plants are poisonous and we don't always know which ones, so don't taste or eat any plants, berries or seeds you find outdoors.**

7. **Never prod or poke at animals or deliberately damage their homes. This may kill or injure them, frighten them away or make them angry.**

8. **If you see only a few flowers, insects or other interesting features in the garden, leave them alone. Otherwise no one else will ever be able to enjoy these, too.**

APPENDIX N: Contents Page of Final Version of *Learnscapes Alive* (January 2002)

Contents

Overview

- Environmental Challenges
- Role of Education: educating for sustainability
- Environmental Education:
  - its nature and principles
  - approaches to environmental Education
  - the value of inquiry approaches for EE
  - the value of integrated approaches for EE
  - congruence of Inquiry Approaches in SOSE, Science and HPE
  - Action Research Inquiry Model
  - 'Integrating Naturally' and 'Integrating Socially' Inquiry Model
  - Democratic Health Education Inquiry Model
- Connecting EE with KLA'S
  - Studies of Society and Environment
  - Science
  - Health and Physical Education
  - Cross-curricular elements
  - Process of inquiry
- Children and Nature
- Learnscaping: School grounds for Environmental Learning

[redacted] State School Learnscaping Project

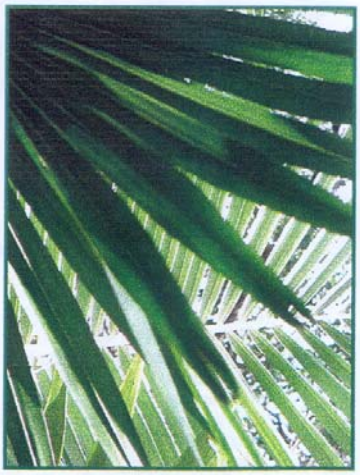
- A Brief History ... from the Principal
- A Brief History
- Learnscaping Story
  - Early Childhood - *The Rainbow Wish*
  - Middle School - *Koala Power*
  - Upper School - *Rainbow Dreaming*
- Integrating Story with Learnscaping

[redacted] State School Learnscaping Program

- How to use this Learnscaping Program
- Tips for Teaching Outdoors
- Earth Carer's Code
- Create Your Own Class Earth Carer's Code

Environmental Activities

- Colour and Scent Garden
- Shape Garden (Mathematics)
- Koala Corridor
- Line and Texture Garden (Art)
- Rainforest/Habitat Gardens (English)
- Aboriginal Food/Use Garden
- Growing Garden (Shadehouse)



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